UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

INTERNATIONAL MONETARY AND FINANCIAL ISSUES FOR THE 1990s

Volume II

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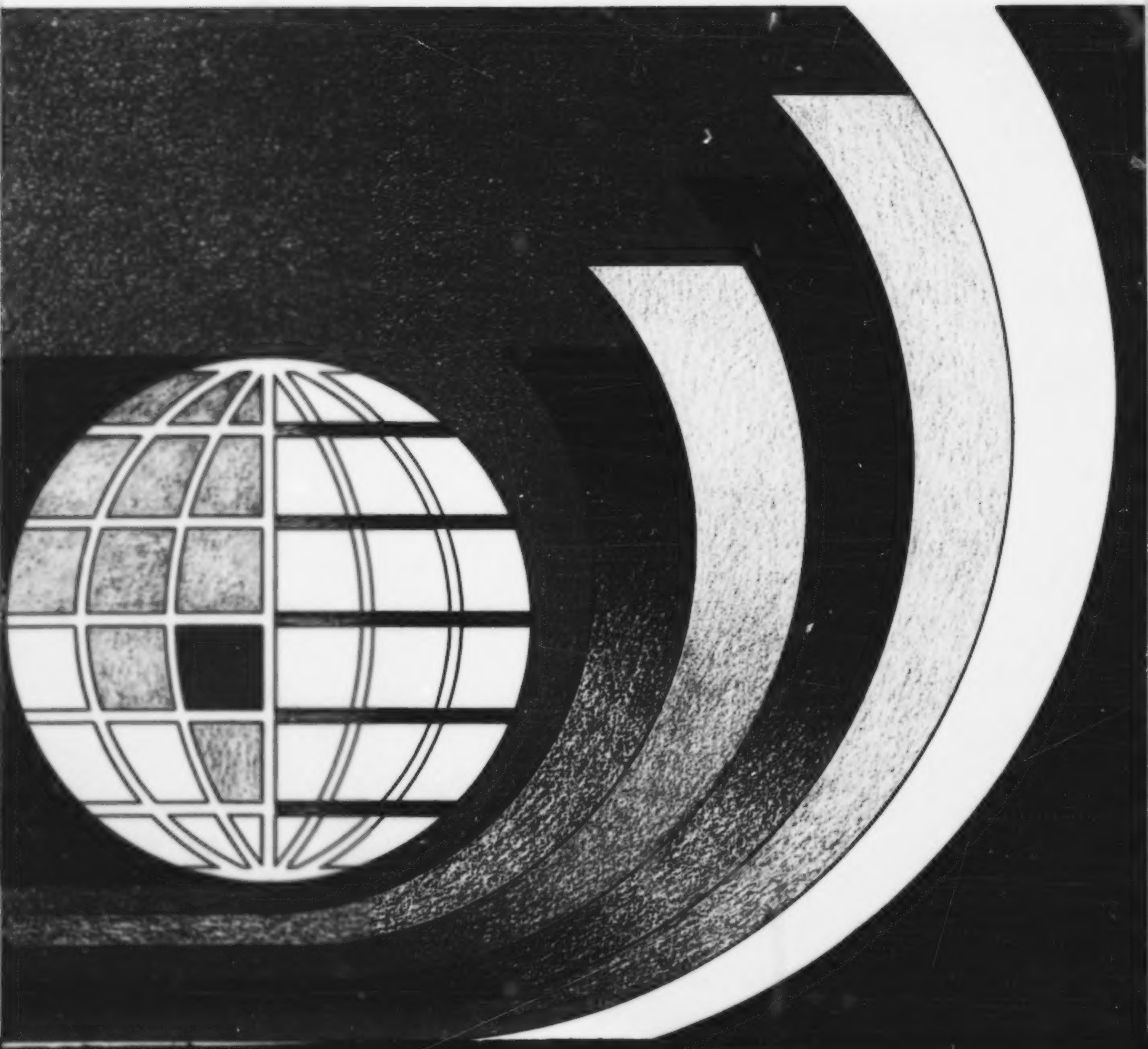

UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

Geneva

INTERNATIONAL MONETARY AND FINANCIAL ISSUES FOR THE 1990s

Research papers for the Group of Twenty-Four

VOLUME II

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Introduction

The Intergovernmental Group of Twenty-Four on International Monetary Affairs (G-24) was established in November 1971 to increase the negotiating strength of the developing countries in discussions that were going on at that time in the International Monetary Fund on reform of the international monetary system. Developing countries felt that they should play a meaningful role in decisions about the system, and that the effectiveness of that role would be enhanced if they were to meet regularly as a group, as the developed countries had been doing for some time in the Group of Ten (G-10).

It soon became apparent that the G-24 was in need of technical support and analysis relating to the issues arising for discussion in the Fund and Bank, including the Interim and Development Committees. In response to representations by the Chairman of the G-24 to the Secretary-General of the United Nations Conference on Trade and Development (UNCTAD), and following discussions between UNCTAD and the United Nations Development Programme (UNDP), the latter agreed in 1975 to establish a project to provide the technical support that the G-24 had requested. This was to take the form, principally, of analytical papers prepared by competent experts on issues currently under consideration in the fields of international money and finance.

Mr. Sidney Dell, a former Director in UNCTAD's Money, Finance and Development Division and subsequently Assistant Administrator of UNDP headed the project from its establishment until 1990. During this period, some 60 research papers were prepared by the Group of Twenty-Four. The high quality of this work was recognized by the Deputies and Ministers of the Group and the reports were given wide currency, some being published in five volumes by North-Holland Press and others by the United Nations.

The project work was resumed in 1990 under the direction of Professor G.K. Helleiner, Professor of Economics, University of Toronto, Toronto, Canada. The UNCTAD secretariat continues to provide both substantive and administrative backstopping to the project. Funding is presently being provided by the G-24 countries themselves, the International Development Research Council of Canada and the Government of the Netherlands. As a result, it has been possible to continue to provide the Group of Twenty-Four timely and challenging analyses. These studies are being reissued periodically in compendia. This is the second volume to be published.

PROSPECTS OF FINANCIAL FLOWS TO DEVELOPING COUNTRIES IN THE 1990S: THE GLOBAL MACROECONOMIC TRADE-OFFS

Rob Vos

Executive Summary

Recent developments in the world economy seem to indicate that access to international capital flows will remain difficult for most poor countries in the immediate future. The concern is about a presumed decline in the global savings availability associated in particular with declining savings rates in the major economies (G-7) where the bulk of global financial resources is generated. A reduced supply of global savings must meet an increased demand for investment resources in the 1990s. Capital demands are expected to remain high in the major economies themselves, while large new capital demands are being projected for the economic transformation in Eastern Europe and the Republics of the former Soviet Union, for the reconstruction in the Middle East after the Gulf war and for action programmes to save the global environment. The availability of funds for the developing countries may be 'crowded out' by these new demands for global savings. Alternatively, since ex-post global savings and investment should balance, attempts to satisfy all these demands (including demands for increased capital flows to developing countries) will trigger a global adjustment process which is likely to lead to higher world interest rates affecting economic growth and trade in both rich and poor countries.

Despite a recovery of savings rates in some industrial countries, concerns about reduced availability of global savings in the medium run seem justified. Demographic factors predict falling private savings rates in the major economies. Public savings in the large economies are being eroded by the accumulation of public liabilities. This has been undermining even further the responsiveness of national savings to adjustments in the global interest rate. The response of private savings to interest rates was assessed to be rather low, while rising interest rates will reduce government savings where public debt is large. The implication for the world economy is that each exogenous shift in the global demand for investment resources, for instance an increase in capital transfers to the developing countries, will require a large interest rate adjustment to restore global capital market equilibrium and will crowd out investment elsewhere.

Many estimates have been given of the capital requirements of developing countries in the 1990s. The methods used to derive these estimates are limited and only cover partial effects. Leaving these methodological limitations aside, the resulting LDC capital requirement estimates are large enough to have a major impact on the world economy. This implies that proposals to raise capital transfers to developing countries will have to take account of global repercussion effects. The direct effect of additional capital inflows may be higher investment and growth in the recipient countries, but at the same time they could lead to rising world interest rates which will enhance debt-service burdens and reduce investment demand and growth in the industrial countries. The latter effect will then spill over to commodity markets and reduce demand for developing country exports.

An assessment of these effects using global trade and macroeconomic models confirms the importance of these repercussions. If additional capital transfers take the form of official development assistance, the effect is like a fiscal expansion in the industrial countries. If this fiscal expansion is financed by increasing public debt the (short- to medium-run) global recessionary consequences may be severe, even to the extent that what is gained through higher capital inflows is (more than) offset by a loss of export earnings. The key to a more stable global adjustment process seems to lie in adequate fiscal adjustment in the North. Northern governments should thus trade off increased aid transfers against other government expenditures.

The workings of the global capital market do not provide developing countries with easy access. Additional transfers will have to come largely from official sources. For most developing countries, private capital markets are still (or always have been) cut off. The recent growth of foreign direct investment and portfolio investment flows has been restricted to a very small group of the larger and richer developing countries. There is scant reason to believe that this renewed access to private capital markets would be spread very widely. At the same time, however, private

agents throughout the developing world have accumulated large foreign asset holdings. However, the mobilization of these funds for domestic development will not be easy. Experience in countries where debt conversion programmes worked to repatriate this 'flight capital' indicates that monies did return after a sustained period of successful adjustment. External finance required for the process of stabilization and adjustment will have to come from official sources. A major part of the developing world is still caught in this process and, in the light of the previous conclusions, will be dependent on budgetary decisions made by the Governments in the industrialized countries.

The existence of elaborate global model(s) thus seems essential to assist international policy analysis. A number of global macroeconomic models is available, but the modelling of the financial linkages between industrial and developing countries is still rather rudimentary with little detail and differentiation with regard to the LDCs. More research will have to be invested in this area.

Introduction

Net resource flows to developing countries contracted sharply after 1982. At the start of the 1990s, prospects for financial flows to these countries still looked gloomy. Recent developments in the world economy seem to indicate that the access to international capital flows will remain difficult for most poor countries in the immediate future. The concern is about a presumed decline in global savings availability, associated in particular with declining savings rates in the major economies (G-7) where the bulk of global financial resources is generated. A reduced supply of global savings must meet increased demands for investment resources in the 1990s. Capital demands are expected to remain high in the major economies themselves, while large new capital demands are being projected for the economic transformation in Eastern Europe and the republics of the former Soviet Union, for the reconstruction in the Middle East after the Gulf war and for action programmes to save the global environment. Funds available for the developing countries may be 'crowded out' by these new demands for global savings. Alternatively, since *ex-post* global savings and investment should balance, attempts to satisfy all these demands (including demands for increased capital flows to developing countries) will trigger a global adjustment process which is likely to lead to higher world interest rates affecting economic growth and trade in both rich and poor countries.

The purpose of this paper is to analyse the determinants of a possible growing 'savings shortage', its implications for the availability of financial resources for developing countries in the 1990s and the global macroeconomic interaction effects of increases in capital transfers to these countries. ***Section I*** assesses the main trends and determinants of the supply of global savings. It is suggested that falling trends are less secular than suggested in some studies. Nevertheless, there is little reason to expect a strong recovery of global savings in the 1990s; rather, structural factors indicate a falling tendency over the medium run. ***Section II*** reviews the magnitude and relevance of recent projections of the so-called 'new' capital demands. Many of the existing projections that appear in policy documents of Governments and international organizations are little more than back-of-the-envelop calculations based on crude assumptions. More elaborate studies at best apply a partial-equilibrium approach to estimate capital requirements of a particular group of countries. Taken together the 'new capital demands' are quite large indeed in relation to global macroeconomic aggregates. This calls for a global general-equilibrium framework to assess the implications if such demands are to be satisfied. Before entering into that question, however, the structural conditions of developing country access to international financial resources are assessed in ***section III***. Developing countries typically have restricted access to the global capital market. In the latter part of the 1980s some developing countries seem to have regained access to private capital markets, particularly larger flows of direct foreign investment and portfolio investment came their way. The analysis shows, however, that this development has been limited to a very small number of countries. The section also discusses the problem of the sizable foreign assets holdings of private agents from developing countries. It is suggested that a repatriation of this 'capital flight' money is likely to be heavily dependent on success in the adjustment effort leading to economic recovery and for which, in most countries, additional capital flows will be required first. Official finance is seen to remain the principle source of external funding on which most of the least developed countries (LDCs) will have to rely in the 1990s. Access to this source may become heavily constrained by fiscal problems in the donor countries and competing demands from Eastern Europe.

If funds from these sources would be forthcoming for developing countries, there will be important global repercussion effects, the cost of which may fall to a considerable extent on the LDCs. ***Section IV*** takes up the latter scenario and analyses the nature of the global adjustment effects. Since there is no single and broadly accepted global model framework, several existing world models are reviewed. First, trade effects are isolated using a simple linear world model and the outcomes are compared with those of other models emphasizing trade links. Next, several empirical global macroeconomic models and their respective simulation results of enhanced capital transfers to developing are compared. Although these models have some crucial differences in specification, they all hint at the critical role fiscal adjustment in the major economies is to play in the 1990s to ensure a more stable global economic environment for the developing countries. Otherwise, with inadequate fiscal adjustment, interest rate and financial instability are expected to produce worldwide recessionary effects, with the developing countries far worse off even with increased financial flows coming their way. ***Section V*** summarizes the main findings and policy conclusions, but also reiterates both the importance and the limitations of existing world models for policy use.

I. Trends and determinants of global savings

Is the concern about a reduced global savings supply leading to a savings shortage justified? This section tries to provide insight in some detail. First, world-wide trends in *ex-post* savings and investment demands are analysed. Subsequently (section IV.B), an assessment is given of the observed determinants of private and public savings and the likely prospects for the decade ahead.

A. Falling savings rates?

Is the decline in the global savings rate during the 1980s structural and likely to extend far into the 1990s? Figure 1, based on recent World Bank data,[1] shows that the world savings rate fell by about 2 percentage points between the early 1970s and the mid 1980s, i.e. from on average 21.8 per cent of world GNP in 1970-1973 to 19.9 per cent in 1983-1985 (see also table 1). However, in recent years there has been some recovery of world savings: 20.6 per cent of world GNP in 1986-1990. Thus, though it is well below the level of the 1960s and 1970s, the fall in the global savings rate may not be secular. Trends differ between the major countries and regions in the world and between economic agents. Figure 2 shows that, for the world economy as a whole, private savings have moved upwards, while goverment savings have fallen. This has led to a growing worldwide gap between, on the one hand, private savings surpluses and, on the other, public sector deficits. The observed trends relate to *ex-post* balances and as such they do not pose a problem in themselves. However, cumulative deficit and surplus savings positions sustained over long periods of time involve large shifts in liability and asset positions of governments and private sector agents, which in turn may affect their savings behaviour and financial market developments. These aspects will be discussed further below. First the diverging trends between countries and regions of the world economy will be described.

This analysis must start with some caveats about the data. Existing data contain substantial statistical discrepancies. This is most obvious in the global savings and investment estimates. Figures 1 and 4 show that the two global macroeconomic aggregates are not equal as they should be according to world accounting rules.[2] This discrepancy has been growing over the past two decades to a recorded global savings gap of about 0.4 - 0.5 per cent of world GNP. This compares,

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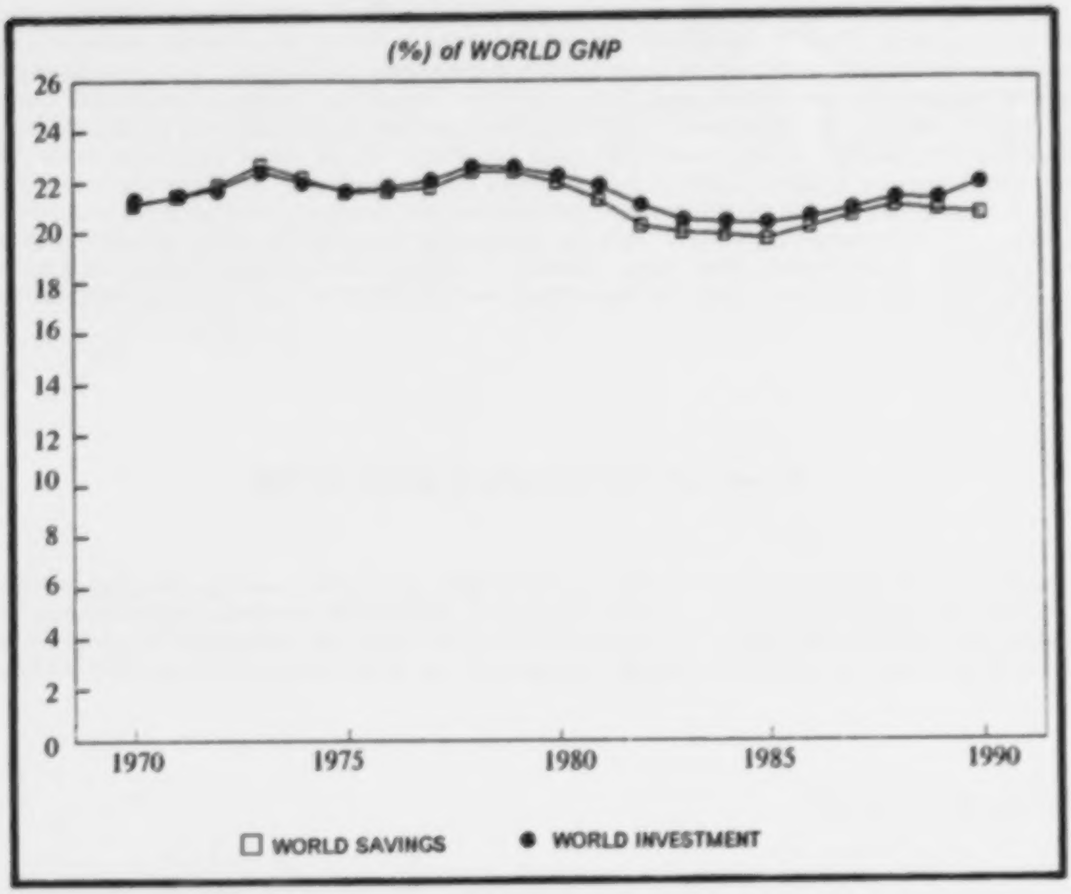
[1] Estimates are derived from World Tables (diskettes, November 1991 update) and the DEC Analytical Data Base (DAD) of the Bank's International Economics Department, which probably gives the best country coverage and provides consistency checks for national accounts, balance of payments, government finance and debtor reporting system data.

[2] See Vos (1989, 1991) for an extensive treatment of a consistent accounting system for a multi-country world economy.

Figure 1
GLOBAL SAVINGS AND INVESTMENT, 1970-1990



in definitional terms, to the world current account discrepancy.[3] Although the statistical error is small relative to global savings or global GNP, it is large compared to the numbers for the new capital demands and the numbers relevant for the global adjustment process discussed in this paper. During the 1980s the discrepancy was annually between US$50 and 100 billion which is in the order of magnitude of the estimates of the additional annual capital requirements for developing countries in the 1990s. The global discrepancy equals about 0.7 per cent of GNP of the industrialized countries, which is at the level of the DAC target for development assistance to developing countries and is double the size of actual aid flows. Consequently, the data presented in this paper should be taken with the necessary caution.

---

[3] The following national and global accounting identities can be defined:

$$S_i - I_i = CAB_i$$

$$\sum_i^n CAB = \sum_i^n E_i - \sum_i^n M_i - \sum_i^n R_i = 0$$

$$\sum_i^n S_i - \sum_i^n I_i = 0$$

where it says that the savings-investment balance of country i ($S_i - I_i$) equals the current account balance (CAB_i), which is defined by exports less imports of goods and services ($E_i - M_i$) less net factor payments and current transfers to abroad (R_i). Exports of one country imply imports for another so that the sum of the CABs of all countries should add to zero. By implication also the *ex-post* world savings-investment balance should be equal to zero.
The data used in the graphs and the tables combine national accounts and balance of payments data. Gross domestic investment (private and public) and private gross national savings are based on national accounts data. The current account balance is based on balance of payments data. Gross national savings are derived as $S = CAB + GDI$ and government savings as $S_g = S - S_p$.

Table 1

GLOBAL SAVINGS AND INVESTMENT RATES, 1970-1990

(Percentage of GNP)

	1970-1973	*1974-1977*	*1978-1982*	*1983-1985*	*1986-1990*
High income countries					
GNS (S)	22.93	21.81	21.73	19.70	20.73
Private (S_p)	19.39	20.29	20.95	20.39	19.62
Public (S_g)	3.54	1.52	0.77	-0.68	1.11
GDI (I)	22.64	22.17	22.04	20.21	21.17
Private (I_p)	18.78	18.35	18.45	17.17	18.05
Public (I_g)	3.86	3.95	3.99	3.93	3.82
S-I	0.28	-0.37	-0.32	-0.51	-0.44
Private (S_p-I_p)	0.61	1.94	2.50	3.21	1.57
Public (S_g-I_g)	-0.32	-2.30	-2.82	-3.72	-2.01
Eastern Europe and former Soviet Union					
GNS (S)	20.15	19.75	19.07	20.26	17.04
Private (S_p)	3.48	2.89	3.57	3.93	7.70
Public (S_g)	16.68	16.86	15.50	16.33	9.33
GDI (I)	20.08	20.42	19.05	19.40	16.98
Private (I_p)	1.07	1.24	1.10	1.13	0.79
Public (I_g)	19.01	19.10	18.99	19.13	19.17
S-I	0.08	-0.67	0.02	0.86	0.06
Private (S_p-I_p)	2.41	1.64	2.47	2.80	6.92
Public (S_g-I_g)	-2.33	-2.31	-2.45	-1.94	-6.86
Major oil exporters					
GNS (S)	26.04	47.02	37.42	20.69	18.88
Private (S_p)	12.85	18.20	10.65	6.65	7.41
Public (S_g)	13.19	28.82	26.77	14.05	11.47
GDI (I)	17.80	22.14	25.02	22.65	17.99
Private (I_p)	5.19	6.73	9.50	8.13	5.26
Public (I_g)	12.61	12.12	12.96	14.24	15.41
S-I	8.24	24.88	12.40	-1.95	0.89
Private (S_p-I_p)	7.66	11.47	1.15	-1.48	2.15
Public (S_g-I_g)	0.58	13.41	11.25	-0.47	-1.27
LDCs					
GNS (S)	17.66	19.68	20.24	19.87	22.44
Private (S_p)	10.28	11.56	11.20	12.77	17.55
Public (S_g)	7.37	8.11	9.05	7.10	4.88
GDI (I)	18.95	21.84	23.49	21.12	23.04
Private (I_p)	8.87	10.55	10.96	9.59	12.22
Public (I_g)	10.08	10.08	10.45	10.86	11.29
S-I	-1.29	-2.16	-3.25	-1.25	-0.60
Private (S_p-I_p)	1.42	1.01	0.23	3.18	5.33
Public (S_g-I_g)	-2.71	-3.18	-3.48	-4.43	-5.93

For source and notes see end of table.

Table 1 (concluded)

GLOBAL SAVINGS AND INVESTMENT RATES, 1970-1990

(Percentage of GNP)

	1970-1973	*1974-1977*	*1978-1982*	*1983-1985*	*1986-1990*
World					
GNS (S)	21.77	21.86	21.70	19.91	20.60
Private (S_p)	15.51	16.54	17.12	17.06	18.01
Public (S_g)	6.26	5.27	4.57	2.81	2.65
GDI (I)	21.68	21.97	22.11	20.43	20.99
Private (I_p)	14.45	14.68	14.69	14.66	14.59
Public (I_g)	7.23	7.23	7.29	7.34	7.33
S-I [a]	0.09	-0.11	-0.41	-0.53	-0.39
Private (S_p-I_p)	1.06	1.95	2.04	2.99	2.56
Public (S_g-I_g)	-0.97	-2.06	-2.45	-3.52	-2.93

Source: World Bank data. Ratios derived from current US dollar values.

Note: GNS (S) = Gross National Savings (= Current Account Balance *plus* GDI). GDI (I) = Gross Domestic Investment. S-I = GNS - GDI = CAB. Subscripts p and g stand for private and public (general government) sectors respectively.

[a] The world savings-investment balance, and hence the world current account balance, should in principle be equal to *zero*. The non-zero entries thus represent the consolidated statistical global accounting discrepancy. See text and e.g. IMF (1987), Vos (1989), Luttik (1992), and De Jong, Vos and Jellema (1991) for futher discussion.

The causes of the discrepancy have been discussed elsewhere and these will not be detailed here.[4] Within the present context it is relevant to have some idea how the discrepancy affects the savings-investment balances across countries. Given the complex structure of the discrepancy when observed transaction-by-transaction, no definite and clear-cut conclusions have been drawn so far. Probably the most complete study on this topic (Luttik 1992) suggests that, on balance, the current accounts of the major economies are only slightly affected and that a major part of the discrepancy should be allocated to major oil exporters in the Middle East. The latter implies that, particularly during the early 1980s, savings surpluses of this region were under-estimated. If so, there has been a corresponding under-recording of foreign assets of this region which could counterbalance the apparent overstatement of the external asset position of some of the main industrialized countries.

Having said this, let's now turn to the major trends in global savings and investment patterns over the past two decades. The main features can be summarized as follows:

(a) About 80 per cent of global savings is generated in the industrialized countries and nearly two-thirds in the G-7 countries (figure 5). Economic growth and savings decisions in these countries thus have an overwhelming influence on the supply of world investment finance resources.

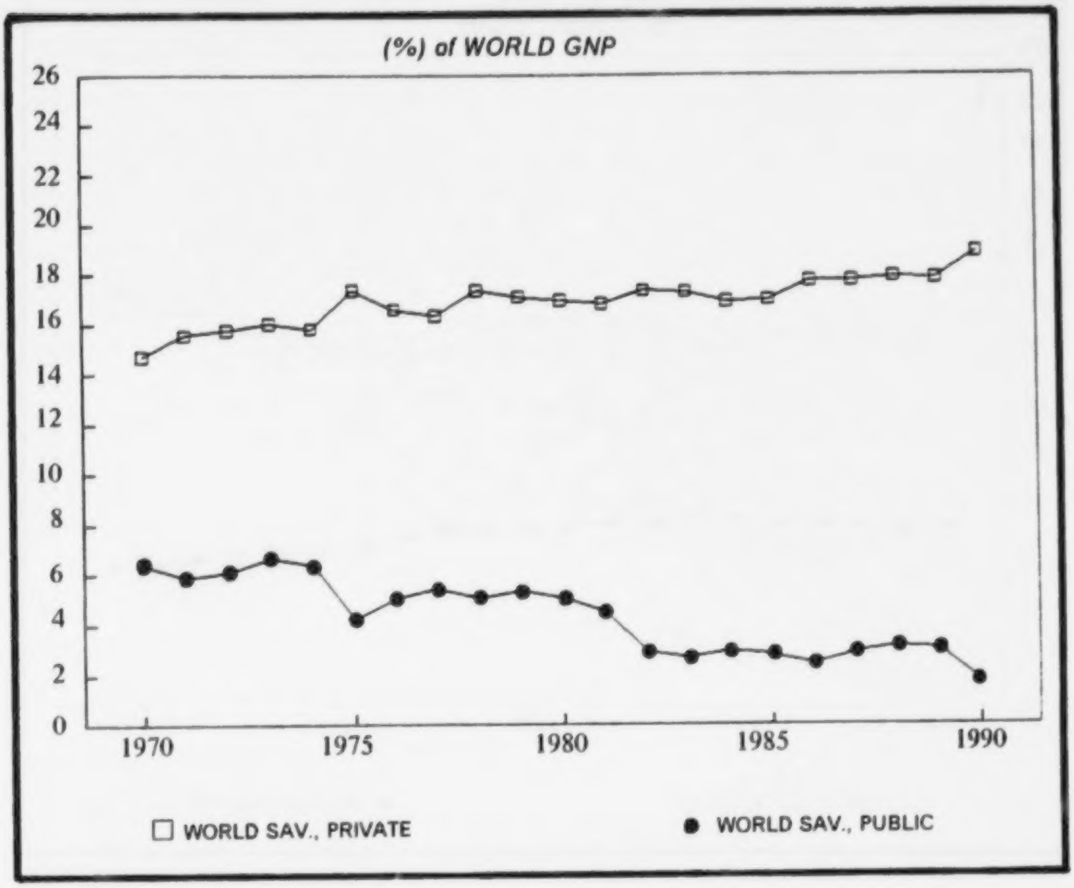
(b) Global savings-investment balances have shown major shifts over the past two decades (see figure 4): (a) the major industrialized economies (G-7) traditionally have been net creditors to the rest of the world (LDCs and the rest of the OECD); (b) after the first oil price hike, G-7 surpluses dwindled and savings surpluses of major oil exporters (around 0.5 per cent of world GNP) became (directly or indirectly) the major source to finance deficits elsewhere, particularly in the LDCs; (c) oil-exporter surpluses vanished in the 1980s,[5] while the G-7 countries became net debtors in the

---

[4] See IMF (1987), Vos (1989), De Jong, Vos and Jellema (1991), Luttik (1992) and IMF (1992).

[5] This trend should be taken with a wide margin of error, given problems of coverage of some major oil exporters in the 1980s (e.g. Iran and Iraq after entering in a war in 1980 are no longer covered). See also the remarks made earlier about the widening global accounting discrepancy.

Figure 2
GLOBAL SAVINGS, PRIVATE AND PUBLIC, 1970-1990



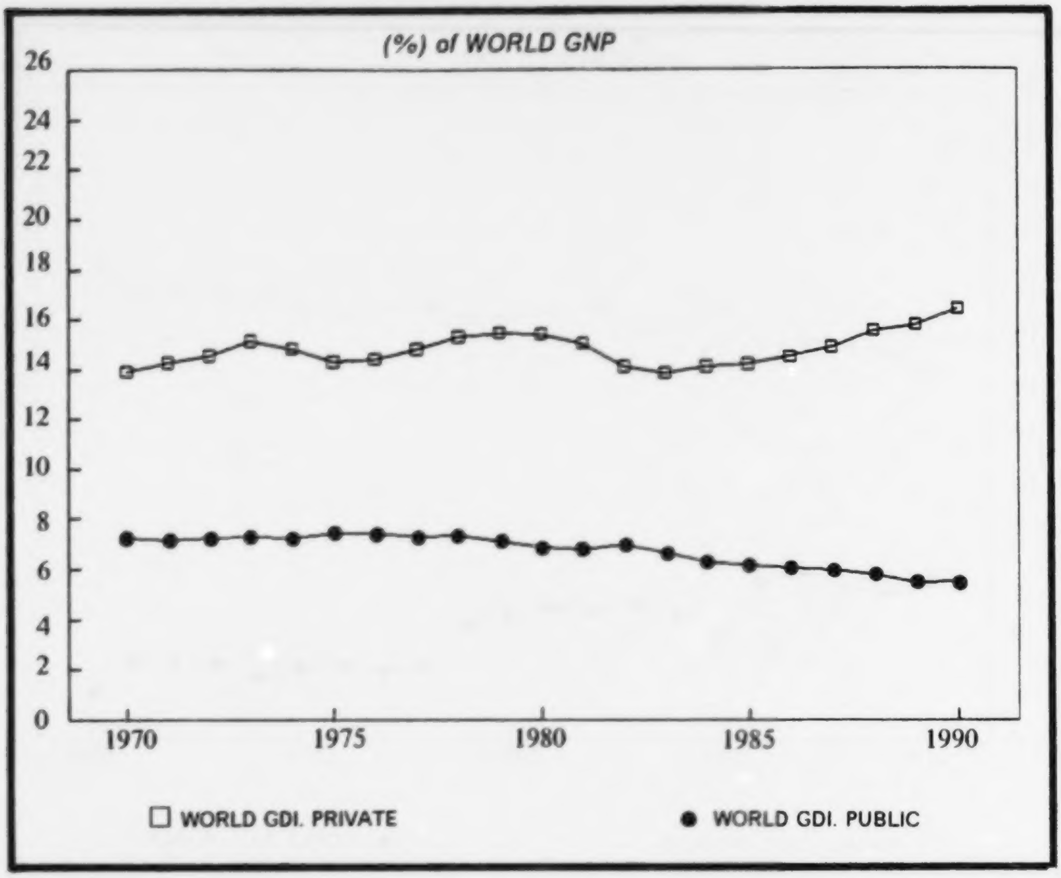
aggregate; as a consequence, reduced international finance availability forced LDCs to reduce their current account deficits; and (d) the former socialist economies in Eastern Europe (EE6 + SU) have remained throughout the past two decades at nearly balanced savings-investment positions.

This picture is still far too aggregate, however. The savings-investment balance positions conceal much larger imbalances observed particularly in the G-3 countries (United States, Japan, Germany), but also conceal differences in the satisfied demands for global savings between groups of LDCs.

(a) The global macroeconomic significance of the diverging pattern of savings-investment balances in the 1980s between the three major economies is pictured in figure 7. Germany and Japan produced joint savings surpluses of between 0.5 and 1.0 per cent of world GNP, which could largely, though not entirely, finance large United States deficits. Figure 8 indicates that for the G-3 as a group, large private savings surpluses were required of around 1.0 and 1.5 per cent of world GNP.

(b) The *ex-post* claims of developing countries on global savings are relatively small, when expressed in terms of total savings or world GNP. Figures 9 and 10 suggest that the net use of global savings by LDCs averaged around 0.3 per cent of world GNP over the past two decades. It peaked at 0.7 per cent at the height of the private lending boom around 1980-1982 just before the outbreak of the debt crisis. Latin American and East Asian middle-income countries took the major share. The closure of private capital markets for LDCs after the debt crisis is clearly expressed in reduced savings-investment imbalances. Their use of external savings was less than

Figure 3
GLOBAL INVESTMENT, PRIVATE AND PUBLIC, 1970-1990



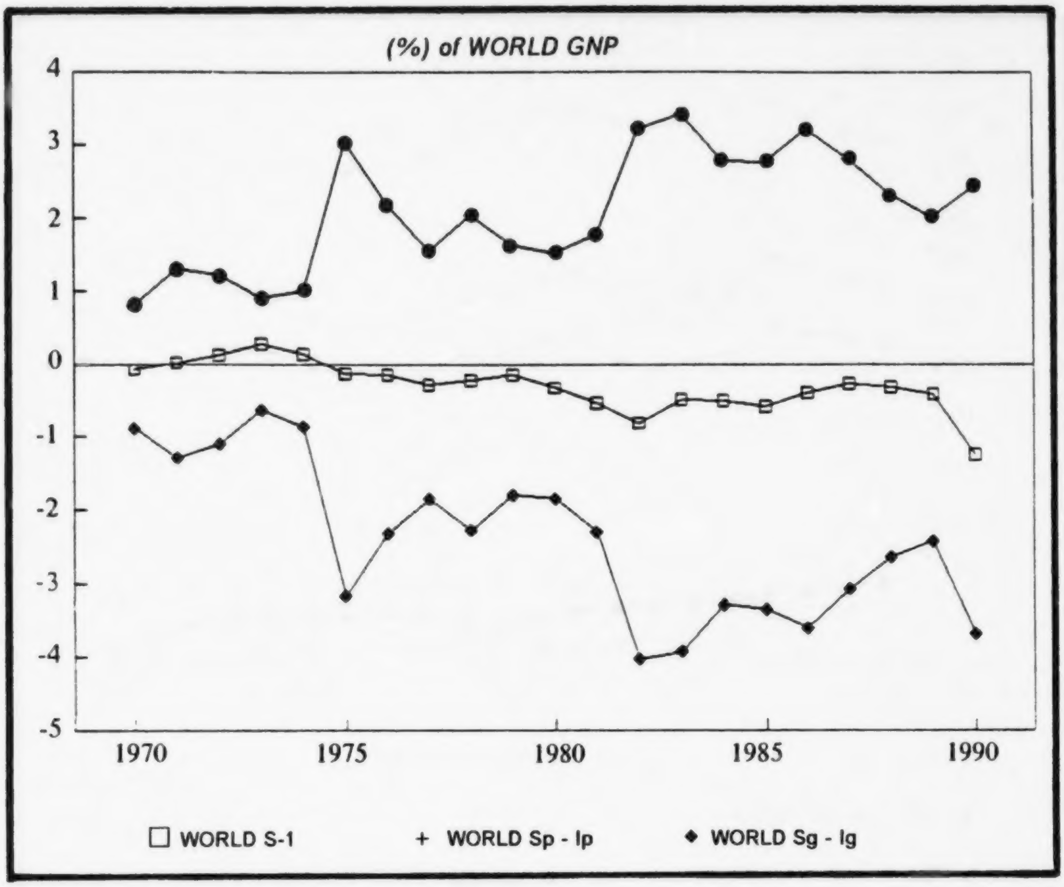
0.2 per cent of world GNP in 1986-1990. The East Asian countries even moved to a surplus position (figure 10). This Asian contribution to available global resources has not been very big in global economic terms, however; between 1986-1990 this surplus was less than 0.1 per cent of world GNP.

Underlying these widening global imbalances are falling private savings rates in some of the major economies, particularly the United States, and falling private investment rates, particularly in Japan and Germany. For LDCs, access to external finance seems to determine much of the shift in private and public savings-investment balances.

(a) The concern over a global savings shortage stems to a large extent from a dramatic decline in the United States savings rate in the 1980s: it fell from 18.7 per cent of United States GNP in 1978-1982 to 14.1 per cent in 1986-90 (see annex tables A1.1a-c). This decline reflects a steep fall in both private and public savings rates. Savings rates have also tended to fall in Japan and Germany since 1970. Since the mid-1980s, however, savings rates improved in both countries. In Germany both private and public savings rates have tended to increase since 1983. In Japan private savings rates have continued to fall, but there was a recovery of the overall savings rate in 1986-1990 due to fiscal adjustment and subsequent increase in the public savings rate.

(b) The steepest fall in national savings rates may be observed in the major oil exporting countries (MOEs), which - leaving statistical problems aside - is associated with rising private and government consumption, foreign workers' remittances to abroad

Figure 4
GLOBAL SAVINGS-INVESTMENT BALANCES, PRIVATE AND PUBLIC 1970-1990

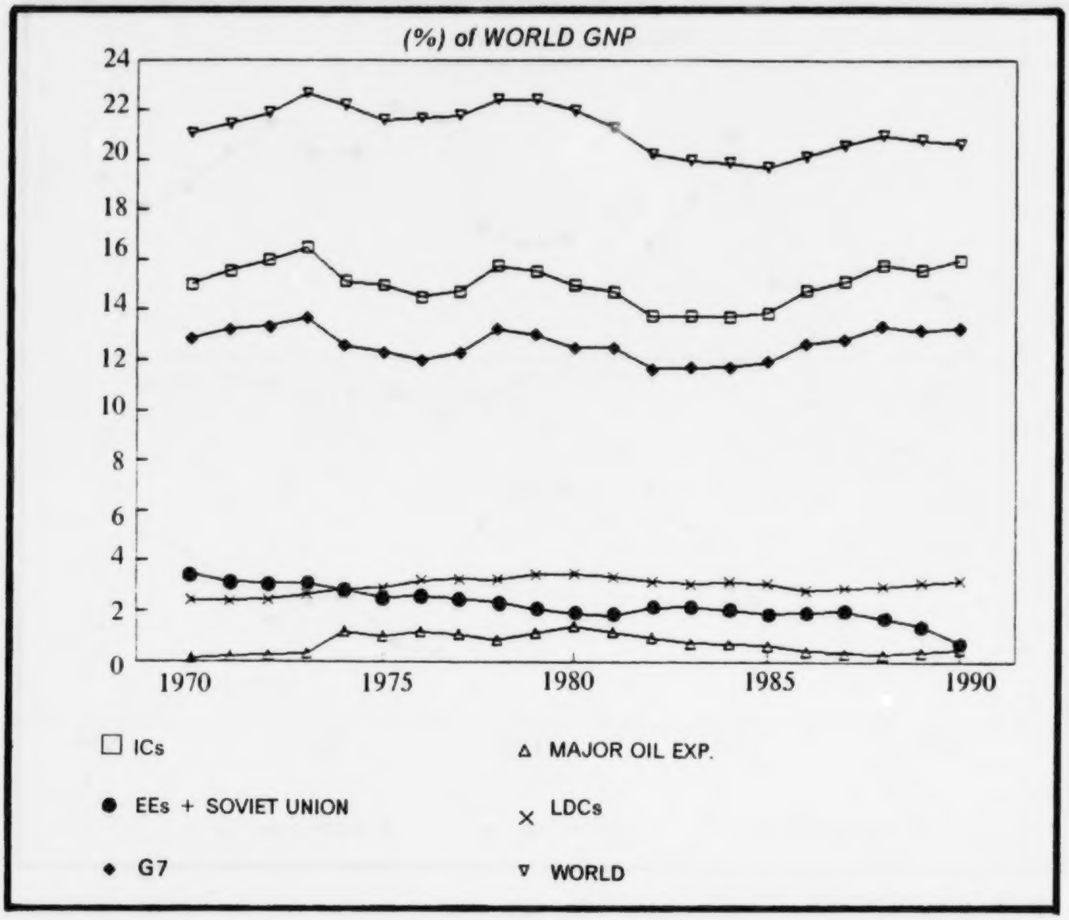


Source: World Bank data.

and armaments expenditures. These factors appear more important in explaining falling savings surpluses of MOEs than rising domestic investment. In fact, the investment rate of these countries fell in the 1980s.

(c) Contrary to IMF data (Aghevli *et al.* 1990), no falling savings rate for developing countries has been observed. Aggregate LDC savings remained stable at around 3.5 per cent of world GNP throughout the 1970s and 1980s (figure 5). As a share of LDCs' own GNP, national savings increased during the 1970s, fell in the years of economic stabilization immediately following the debt crisis (1983-1985), but increased again in recent years (1986-1990) (see table 1 and annex table A1.1a-c). This may have to do with the fact that many LDCs went through a series of structural adjustment programmes. However, income growth remains the main determinant of private savings in developing countries (see Schmidt-Hebbel and Webb 1992), while the degree of success of structural adjustment programmes to raise growth rates has been, to put it mildly, rather diverse across countries (Mosley, Harrigan and Toye 1991). Thus the policy influence on the observed trends is not immediately clear. Countries in sub-Saharan Africa (SSA) and Latin America (LAC) have lower savings rates (respectively about 11 and 19 per cent of GNP) than in the early 1970s or even before, despite some recovery in 1986-1990 (annex tables A1.1a-c). In SSA, falling per capita incomes and steeply falling external terms of trade probably underlay the collapse of the private savings rate in 1978-1985. Some improvement in these indicators in 1986 to 1990 led to a recovery in the private savings rate. In contrast, in LAC, private savings appear to have increased even during the crisis years of the 1980s. Much of this relates to 'forced' savings induced

Figure 5
GLOBAL SAVINGS RATES, 1970-1990



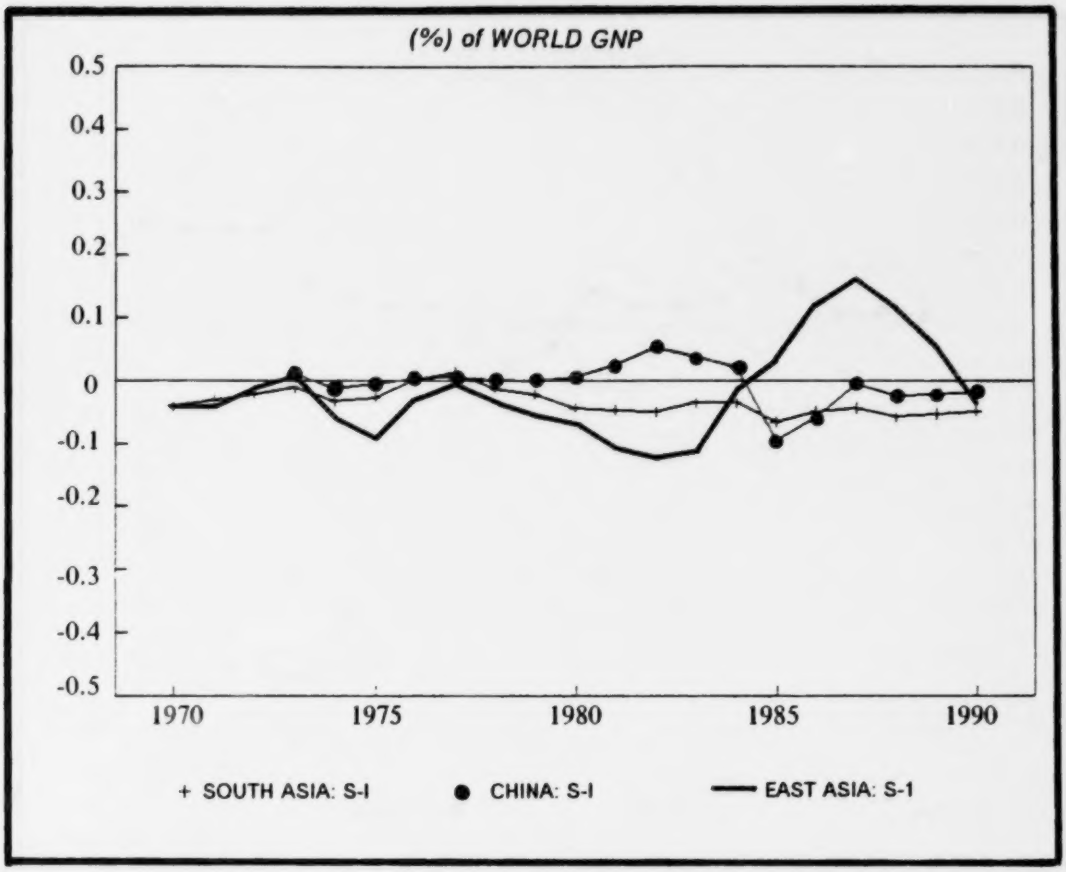
by the high inflation rates in most of these countries. High inflation has been associated with steeply falling public savings rates and rising fiscal deficits. Falling public savings figure in the rising external debt service burden of the public sector of these countries. With (much more) limited access to foreign finance than in the previous decade, falling savings rates led to falling gross investment rates in SSA and LAC in the 1980s. In SSA GDI fell to 12 per cent of GNP in 1983-1985 and recovered to 15 per cent in 1986-1990: still below the 1970 level and probably just about enough to replace the existing capital stock, but not enough to expand production capacity in any significant way. Also in LAC the investment rate fell steeply in 1983-1985: from 23 to 17 per cent on average (in some countries the drop was much steeper). The rate moved back to 20 per cent in 1986-1990, reflecting substantial recovery in some countries (Mexico, Brazil, Chile), while others still lagged behind.

(d) More stable and upward savings trends can be observed in South and East Asia. Most countries in these regions followed more prudent fiscal policies, keeping public savings rates up. External indebtedness either did not take quite the dimensions it took in SSA and LAC (the Philippines being a noticable exception) or could be coped with having dynamic export-oriented industries already in place. In many parts of Asia high growth rates could be sustained, stimulating higher private savings rates.

In sum, falling savings rates were not a universal trend. The central problem would appear to lie in the decline of private savings in the major economies (particularly the United States and Japan). Adequate fiscal adjustment could help to compensate for this through rising public savings and thereby ease pressures on capital markets. Particularly in the United

Figure 6

LDC EX-POST DEMAND FOR GLOBAL SAVINGS, 1970-1990
SOUTH ASIA, CHINA AND EAST ASIA & PACIFIC



States this has been insufficient and the national savings rates has continued to fall. Japan and Germany managed to increase their national savings rates towards the end of the 1980s. Should this provide a basis for optimism over the adequacy of global savings in the 1990s?

B. Determinants of global savings supplies and prospects for the 1990s

The evidence available concerning the structural determinants of savings in the major economies does not give rise to a great deal of optimism. Private savings in these countries are expected to show further downward trends.[6]

(a) Demographic factors, in particular an increased elderly-dependency ratio, are perceived as forming a key determinant behind falling private savings rates. Some studies have down-played the importance of demographic change as a major determinant of falling private savings in the United States, Japan and the European Community in the 1980s (Bosworth *et al.* 1991; *European Economy* 1990), but with regards to the long run there seems to be a broad consensus on potentially large declines in private savings owing to the expected significant rise in the 64age cohort in total population. This is expected to become an important factor in Japan and Europe in the 1990s and in North America by the turn of the century.

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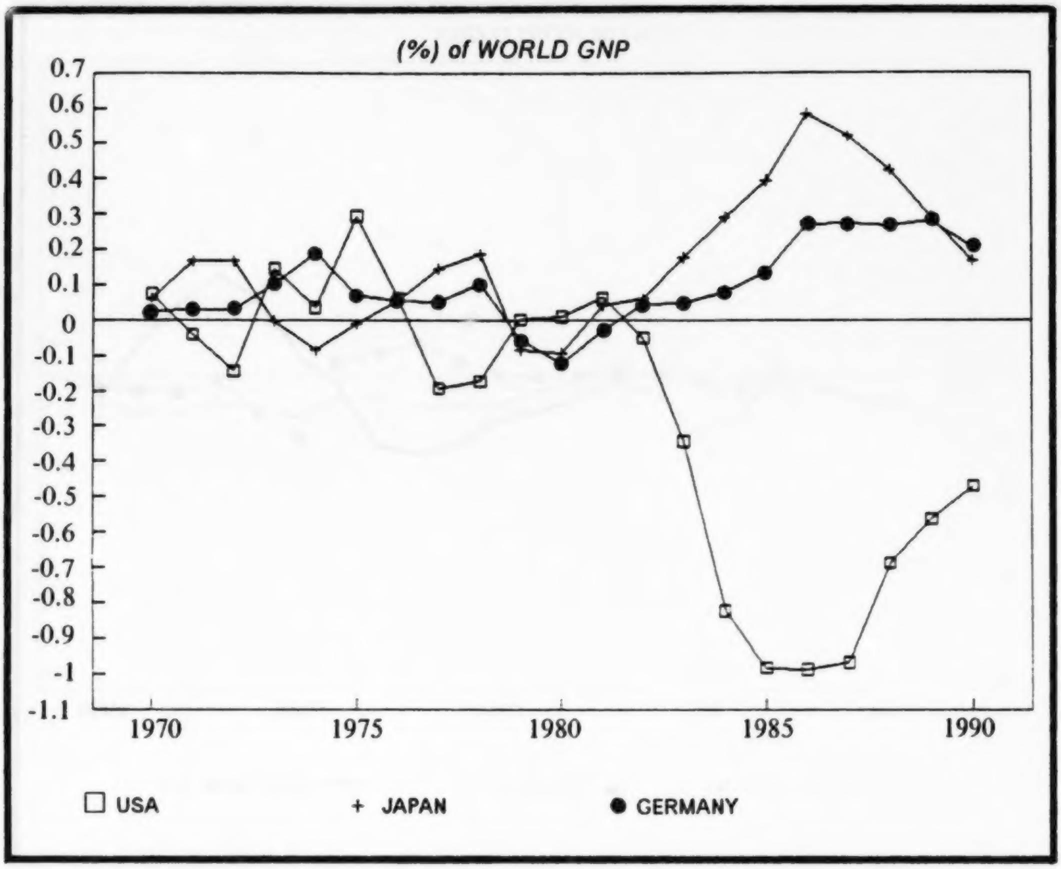
[6] See among others, Aghevli *et al.* (1990), Bovenberg and Evans (1991), *European Economy* (1990), Masson (1990).

Figure 7
G-3 SAVINGS-INVESTMENT BALANCES, 1970-1990
USA, JAPAN, GERMANY



(b) Rising private wealth is seen as another determinant of falling private savings rates in the 1980s. The value of equities and housing increased significantly and this would diminish the need for saving out of current income. One study suggests this might explain about three-quarters of the decline in the savings rate in Japan and a 2 percentage point decline in the savings rate in the United States (Aghevli *et al.* 1990). The role of the interest rate is theoretically ambiguous. A higher interest rate increases future private income and wealth, inducing an increase in current consumption. It may also encourage current savings as future consumption will be expected to increase. While the empirical evidence is not conclusive, it does seem that interest rate changes have had only a slight effect on savings in the major economies (Aghevli, *et al.* 1990). To the extent that household savings respond positively to a rise in interest rates, this may be (partly) offset by falling corporate savings.[7] Higher interest rates have a negative impact on corporate savings. Thus the effects of wealth holdings and interest rates on private savings in the major industrialized countries seem ambiguous. This suggests a rather low elasticity of private savings to the interest rate, so that an *ex-ante* global savings shortage will not allow for a quick capital market adjustment. Many empirical models of the world economy, in contrast, assume a fairly elastic response of private savings to interest rate changes and therefore, as discussed in section IV, such expectations may be too optimistic regarding the speed of the global adjustment process.

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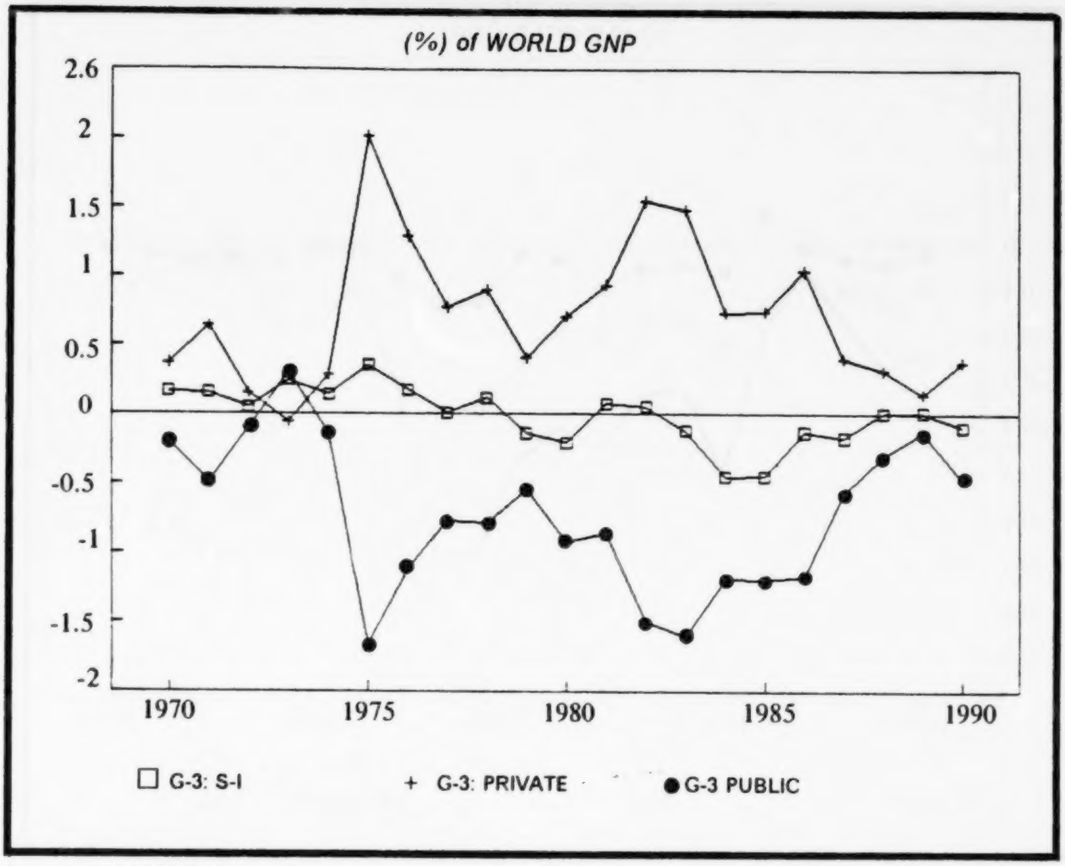
[7] Household savings and corporate savings tend to show opposite trends in OECD countries (see *European Economy* 1990), though not in a one-to-one relationship. As said higher interest rates may have some positive effect on household savings, but raise costs and thus reduce profits of companies. Also, higher corporate savings may have a positive effect on asset prices, which will raise household wealth and affect household savings negatively.

Figure 8

G-3 SAVINGS-INVESTMENT BALANCES, 1970-1990
– PRIVATE AND PUBLIC –



Source: World Bank data.

(c) Fiscal deficits may have a positive impact on private savings, according to some theoretical notions. First, fiscal expansion may lead to higher income growth under unemployment and induce higher private savings. Secondly, a higher public debt may lead private agents to save more in order to compensate for an expected tax increase in the future.[8] Empirical evidence shows, however, a weak offsetting tendency between public deficits and private savings; the trends in the relevant ratios for the United States being the clearest example: the United States fiscal deficit widened from 1 per cent of GNP to 3.3 per cent between 1978-1982 and 1983-1985, while private savings fell from 18.2 to 17.2 per cent.

(d) Widening fiscal imbalances and accumulation of public sector liabilities further undermine the responsiveness of national savings to global interest rate shifts. Interest rate increases in response to an *ex-ante* savings gap will push up public debt service obligations and so depress government savings. Table 2 shows some approximate figures of the shifts in the net (financial) asset positions of the three major economies. The G-3 shifted from a net creditor to a net debtor position vis-à-vis the rest of the world between 1980 and 1989 (the creditor positions of Japan and Germany do not compensate for United States net liabilities), but more salient is the growth of public liabilities in all three economies. These asset positions are

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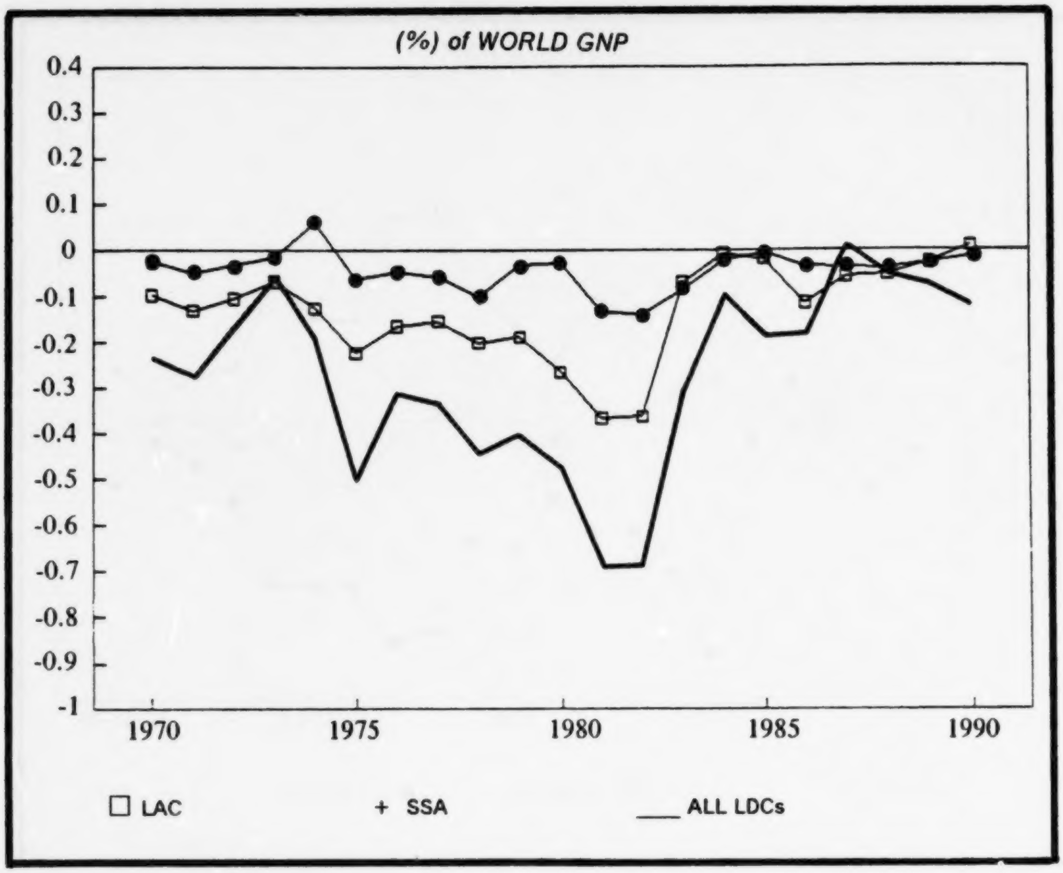
[8] This intertemporal private savings behaviour in response to fiscal deficits and public sector borrowing is known as the 'debt-neutrality' or Ricardo-Barro equivalence hypothesis.

Figure 9

LDC EX-POST DEMAND FOR GLOBAL SAVINGS, 1970-1990
-- ALL LDCs, LATIN AMERICA AND SUB-SAHARA AFRICA --



likely to hamper a smooth adjustment process in the 1990s and, without major fiscal adjustment, will keep public savings down in the major economies and thereby weigh on global savings.

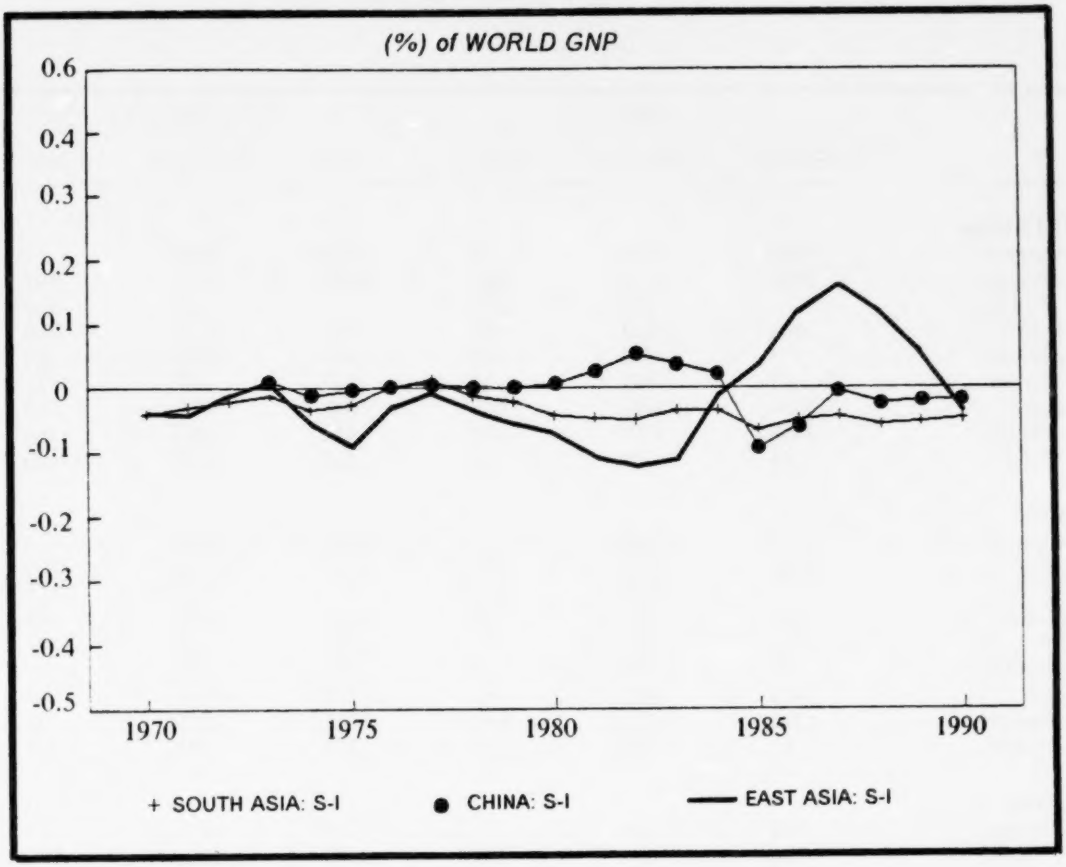
In sum, despite some recovery in the supply of global savings towards the end of the 1980s, the factors listed above suggest that there is not much reason for optimism in terms of the trend continuing during the 1990s. Private savings are expected to stagnate in the major economies as are public savings unless significant fiscal adjustment takes place. New capital demands from the East and the South may thus encounter a serious savings supply constraint in the North.

II. Additional demands for global savings

Before entering into the discussion of the global effects of increased capital transfers to the East and, particularly, to the South under the world economic conditions sketched above, it may be useful to identify the orders of magnitude of the new capital demands as they have been put forward in various studies and policy documents. It is not the objective of this paper to improve on any of the existing estimates of new demands for global savings. The numbers produced all tend to have global macroeconomic significance; some would require, if satisfied, revolutionary changes in the existing global savings and investment pattern. It does seem

Figure 10

LDC EX-POST DEMAND FOR GLOBAL SAVINGS, 1970-1990
-- SOUTH ASIA, CHINA AND EAST ASIA & PACIFIC --



Source: World Bank data.

useful, however, to assess their meaning, before entering into the discussion of possible global economic repercussions. The numbers appear as follows:

(a) Investment demand in the major industrialized countries should remain high according to some calculations (IMF 1991b) in order to achieve more satisfactory growth rates in the 1990s. The following sections show how growth rates in the North are also crucial for economic performance in the South and East. In order to maintain the growth rate of output at 2.75 per cent per annum, like the 1980s, the industrialized countries will have to raise their average investment rate by 1 percentage point during the period 1991-1996 (IMF 1991b: 45). With an expected fall in the private savings rate of 0.75 percentage points, savings may fall short. If Governments of the industrialized countries meet their intended budget targets, however, this is expected to lead to reduced absorption of savings by Governments of 2 percentage points of GNP. Full implementation of these targets thus seems a minimum requirement to provide the investment finance required to sustain growth in the North.

(b) Wide-ranging estimates exist as to the external finance requirements for the transformation of the Eastern European countries, the Community of Independent States (CIS, i.e. the former Soviet Union) and for German unification. All are, however, sizeable and of global macroeconomic importance. Table 3 summarizes the range of estimates derived from a number of studies (see annex table A1.2 for details).[9]

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[9] Collins and Rodrik (1991), IMF (1991b), Papadia *et al.* (1991), Masson and Meredith (1991).

Table 2

G-3: SHIFTS IN NET FINANCIAL ASSETS POSITIONS, PRIVATE AND PUBLIC SECTOR, 1980 AND 1989

(Billions of US$)

	1980			*1989*		
	Assets	*Liabilities*	*Net*	*Assets*	*Liabilities*	*Net*
United States						
Domestic	1966	1966	0	4625	4625	0
Private	1966	1745	221	4625	3783	842
Public		221	-221		842	-842
Foreign	608	501	107	1412	2078	-666
Private	517	339	178	1253	1641	-388
Public	91	162	-71	159	437	-278
Total	2574	2467	107	6037	6703	-666
Private	2483	2084	399	5878	5424	454
Public	91	383	-292	159	1279	-1120
Japan						
Domestic	1169	1169	0	4040	4040	0
Private	1169	895	274	4040	3480	559
Public		274	-274		559	-559
Foreign	204	291	-87	1771	1477	294
Private	113	129	-16	1597	1410	187
Public	91	162	-71	174	67	107
Total	1373	1460	-87	5811	5516	294
Private	1282	1024	258	5636	4890	746
Public	91	436	-345	174	626	-452
Germany						
Domestic	744	744	0	1315	1315	0
Private	744	636	108	1315	1039	276
Public		108	-108		276	-276
Foreign	260	215	45	695	474	221
Private	190	185	5	581	349	232
Public	70	30	40	114	125	-11
Total	1004	959	45	2010	1789	221
Private	934	821	113	1896	1389	508
Public	70	138	-68	114	401	-287
Total G-3						
Domestic	3879	3879	0	9980	9980	0
Private	3879	3276	603	9980	8303	1677
Public	0	603	-603	0	1677	-1677
Foreign	1072	1007	65	3878	4029	-150
Private	820	653	167	3431	3400	31
Public	252	354	-102	447	629	-181
Total	4951	4886	65	13858	14008	-150
Private	4699	3929	770	13411	11703	1708
Public	252	957	-705	447	2306	-1858

Source: IMF, *Balance of Payments Statistics*, various issues (stock data). IMF, *International Financial Statistics*, various issues.

Note: Domestic asset positions refer to financial assets and liabilities only, net of inter-bank and intra-government positions.

Table 3

ALTERNATIVE ESTIMATES OF EXTERNAL FINANCING REQUIREMENTS OF LDCs, EASTERN EUROPE AND CIS IN THE 1990s

(Annual flows in billions of US$ of 1990)

	Net transfer [a] *1990*		*Net resource flow* [b] *1990*	*Financial requirements 1990s*	
	Total	*(Excl. grants)*	*Total*	*Low*	*High*
Developing countries					
All LDCs	16	(-10)	83	77	180
Sub-Saharan Africa	12	(1)	17	15	28
Asia	12	(7)	34	18	23
South Asia	4	(1)	8		
East Asia and Pacific	8	(6)	26		
Europe, Middle East and North Africa	-2	(-10)	13	8	8
Latin America and Caribbean	-6	(-9)	19	36	61
Eastern Europe and CIS					
EE5, CIS, German unification				55	393
Eastern Europe (EE5)			3 [c]	10	124
CIS			2 [c]	15	189
German unification				30	80
Total LDCs and Eastern Europe, CIS and GU				98	573
(As per cent of world GNP, 1990)				(0.7)	(2.7)

Memorandum: Net transfers by source

	Net transfers [a] *1990*		
	Official (excl. grants)	*Grants*	*Private*
All LDCs	4	26	-15
Sub-Saharan Africa	2	11	-1
Asia	5	5	2
South Asia	3	3	-2
East Asia and Pacific	2	2	4
Europe, Middle East and North America	-4	8	-6
Latin America and Caribbean	1	2	-9

Source: World Bank, *World Debt Tables, 1991-92*, for net transfer and resource flow data to LDCs and annex table A1.2 for alternative estimates of financing requirements for the 1990s.

a Net disbursements of medium and long-term debt plus official grants plus net direct foreign investment less interest payments less profit remittances.

b Net disbursements of medium and long-term debt plus official grants plus net direct foreign investment.

c Data for EE5 and CIS refer to 1989 and new gross disbursements of medium and long-term publicized bank credits or bond issues taken from OECD (*Financial Market Trends*, 1991, table 12).

The upper bound estimates of required annual capital inflows shown are close to 2 per cent of world GNP but still quite modest compared to some other "needs" calculations.[10] The upper bound estimates take Collins and Rodrik's (1991) calculations of investment requirements based on a 7 per cent growth target of real GNP. The authors assume without explicit argument that all financial requirements (US$915 billion per annum, see annex table A1.2) have to be satisfied by external resources. These estimates of Collins and Rodrik have been adjusted in table 3, deducting projected national savings in Eastern Europe and CIS, assuming (possibly optimistically) a constant 1990 savings rate. The lower bound estimates for the EE5 and republics of the former Soviet Union have little to do with an estimate of recipients "needs", as these are based on a Marshall Plan-like operation. The estimates represent real per capita aid flows for Eastern Europe equal to that received by the western European countries after World War II (Economic Commission for Europe, 1990; Collins and Rodrik 1991).

(c) Capital-requirements estimates for developing countries are based on traditional methodologies originating from Rosenstein-Rodan's one-gap (savings gap) Harrod-Domar growth model (Rosenstein-Rodan 1961) and Chenery and Bruno's two-gap (savings and trade gap) model (Chenery and Bruno 1962). Despite the rigidity and obvious limitations of these model frameworks, they have remained influential to date. In essence, the approach is to set a desired level of GDP growth which, for a given capital-output ratio, determines the appropriate investment level. For a given savings rate and import coefficient, a domestic savings and a foreign exchange gap can be derived which will determine the financing requirements. Recent extensions of this framework (Bacha 1990, Taylor 1990) include a third gap, i.e. the fiscal gap, to take into account the "double transfer" problem that has plagued developing countries in the 1980s and 1990s: first, they have to send hard currency abroad to meet interest obligations, hence they need a trade surplus as net capital inflows are less than interest payments; and, second, the public sector is largely responsible for these payments, meaning it must run a non-interest budget surplus or find domestic finance. The three-gap model takes account of the fact that developing countries may face a binding 'financial' constraint as opposed to the 'real' external constraint emphasized by the two-gap model. Table 3 also summarizes a number of calculations of external financing requirements of developing countries based on two- gap (Fishlow 1987, Development Committee 1988), three-gap (WIDER, Taylor 1990) and current-account models[11] and applying modest growth targets. The range of estimates for annual external financial requirements for the 1990s lies between US$77 and 120 billion, which is somewhere between 0.5 and 0.8 per cent of GNP of the industrialized countries, or roughly the DAC target for development assistance. Do these imply additional demands for global savings? Table 3 also gives for comparison the net transfer[12] and net resource flow[13] to developing countries in 1990. The lower bound financial requirements would be covered by the net financial resource flow (including direct foreign investment) in 1990 which amounted to US$83 billion. However, it is more appropriate to look at the net transfer as the financing requirement estimates essentially refer to the trade gap (two-gap) or financing gap of required capital inflows less interest payments (three-gap).[14] Net transfers to developing countries were US$16 billion in 1990 (up from an average *negative* annual net transfer of US$5 billion in 1985-1989). Thus from the existing situation in 1990, net transfers to developing countries would have to increase by about US$60 to 100 billion during the 1990s to meet growth targets which are in the order of magnitude of 1.5 to 2.0 per cent per capita income growth. The gap is largest for the Latin American countries which, according to these estimates, would have to revert from a negative transfer of US$6 billion to a positive one of between US$36 and 60 billion. For sub-Saharan Africa there would be an additional demand of between US$3 and 16 billion per year, while in Asia additional demands are likely to be small.

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[10] Collins and Rodrik (1991) for instance also produce a capital requirements estimate of approximately US$1.6 *trillion* per year, which would be about 8 per cent of global GNP and almost equal that of the recipient countries. This estimate is based on simple production function (Cobb-Douglas type) calculations with fixed coefficients targetting to reach the capital-labour ratio of the industrialized countries in a time frame of 10 years. The resulting numbers may have an illustrative meaning, but that is as far as it goes.

[11] The World Bank study on African financing needs (World Bank 1991) uses a simple current account projections model with assumptions about export growth, import elasticities, projected debt service obligations and debt relief.

[12] Net transfer = net disbursements of medium and long-term debt + official grants + net direct foreign investment - interest payments on external debt - proof remittances.

[13] Net resource flow = net disbursements of medium and long-term debt + official grants + net direct foreign investment.

[14] An exception is the World Bank estimate of financing requirements for sub-Saharan Africa which is based on current account projections: the annual financial resource flow requirement is estimated at US$28 billion, while the capital inflow in 1990 amounted to US$17 billion.

(d) On top of the above-listed demands for global savings come demands for the reconstruction of the Middle East after the Gulf war and finance required to fund the global environmental action programme discussed at the United Nations Conference on Environment and Development (UNCED). The IMF has estimated additional external capital requirements for reconstruction in the Middle East at roughly US$13 billion per year for 1991-1996. Financing requirements for environmental action have also yielded a wide range of estimates. Agenda 21 of UNCED comprises an international action programme for the environment and development (on top of domestic efforts) with an estimated cost of US$125 billion per annum in the form of concessional assistance for the developing countries.[15] However, it is at the same time suggested that US$15 billion would be a 'more realistic' amount, given the absorptive capacity of countries to implement environmental programmes and given likely available finance for such purposes.

The sum of all these demands amounts to very impressive numbers indeed. Combining all the lower bound estimates would yield additional capital demands equivalent of 1.4 per cent of world GNP (about US$280 billion annually), while the upper bound estimates come to 3.8 per cent of world GNP (US$800 billion).[16] These numbers seem far too large for comfort. The previous section already sketched a rather pessimistic outlook for the growth in global savings and showed the rather narrow margins within which savings-investment balances (as a share of global GNP) of the major economies moved and which were enough to provoke substantial global adjustment effects. To satisfy their own investment demands and those in the East and the South, the developed economies will have to reverse trends in private and public savings rates.

Of course, the estimates of financing 'needs' in the 1990s discussed above are crude and calculated using rather simple methods. Some of the estimates, like the lower bound numbers for Eastern Europe and UNCED, do not reflect a calculation of financing requirements, but rather reflect "guesstimates" of the authors of what would be a 'realistic' level of capital flows. The models used to estimate 'needs' are based on very crude assumptions about economic behaviour, such as assuming constant savings rates and capital-output ratios over long periods of projection. Further, the methods are static and partial in the sense that domestic and global general equilibrium effects are not accounted for, e.g. in terms of the effects of

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[15] See UNCED (A/CONF.151/PC/100/Add.9) and the Tokyo declaration of the Eminent Person's Meeting on Financing Global Environment and Development (UNCED press release, 17 April 1992). It should be noted that Agenda 21 covers environmental *and* development programmes, such that there is likely to be some overlap with the estimates of financial requirements for developing countries discussed above. In fact, at UNCED (June 1992) it was agreed that the industrialized countries would try to raise aid flows to 0.7 per cent of GNP by the year 2005. This refreshed commitment to the old DAC target was, once again, non-binding.
The *World Development Report* (World Bank 1992) estimates a cost of US$75 billion of a set of environmental projects for developing countries. It is suggested, however, that not all of these additional investment costs should be covered by external finance, but rather that most could be funded by the LDCs themselves, i.e. out of income growth resulting from better economic management.

[16] These magnitudes are derived as follows:

	Original specification (US$ billion, 1990 prices)		As a percent of world GNP	
	High	Low	High	Low
Industrialized countries investment demand (+1 per cent)	145	145	0.7	0.7
Eastern Europe and CIS	393	47	1.9	0.2
LDCs (gap = requirements - 1990 transfers)	114	61	0.5	0.3
Middle East	17	17	0.1	0.2
UNCED	125	15	0.6	0.1
Total	794	285	3.8	1.4

Source: Table 3 and annex tabie A1.2.

capital-inflow induced income increases on savings rates and the effects of additional flows on world interest rates, growth in the creditor countries, trade, commodity prices, and so on.

It thus seems easy to dismiss proposals for mobilizing funds for the purposes listed above. Nevertheless, it cannot be denied that the listed numbers play a role of some influence in the international policy debate and that it is therefore useful to think through the implications for the world economy as a whole. Further, it remains useful to try and estimate the financing requirements to achieve particular policy targets (like a target GNP growth rate). In practice, growth objectives have been the residual of available finance. With the dismal growth performance of many developing countries in the 1980s, it seems reasonable that their policy makers would put forward claims on external financial resources which are derived from their growth and development targets. Probably, more research should be devoted to the improvement of the existing methodologies to estimate financial resource requirements. Given the likely magnitude of the estimates, a new method should comprise a global framework to take account of the direct and indirect international economic repercussions of *ex-ante* shifts in the distribution of global savings.

III. LDC financial market access, 'capital flight' and 'crowding out' of aid budgets

The central question is not, of course, whether or not there is a tendency towards an *ex-ante* global savings shortage, but what type of adjustment mechanism is set in motion and who gains and who loses in the process. Main-stream economic theory assumes savings and investment are a function of the real interest rate.[17] Under perfect market conditions savings, investment and the world interest rate would be determined simultaneously. An increase in the real interest rate would be associated with increased global savings and decreased global investment. In the absense of restrictions on international capital flows and the functioning of the global capital market, capital should flow to capital-scarce economies where the expected rate of return per unit of investment is highest. If these conditions hold, global savings would be allocated at the margin towards LDCs and Eastern Europe where capital-labour ratios are considerably lower than in the industrialized countries. This process would continue until expected real returns on investment are equated across countries.

New capital demands (or increased perceived investment opportunities) will, within this framework, push up real interest rates, but subsequently raise global savings, reallocate these to developing countries and Eastern Europe, and reduce investment demand in the industrialized countries. The more responsive global savings are to interest-rate changes, the quicker the adjustment and the smaller interest-rate movements are for a given shift in the investment demand function. Alternatively, if the supply of savings is relatively insensitive to the interest rate, as argued on empirical grounds in section I above, a relatively large increase in the cost of capital will be required with a relatively large diversion of investment resources away from the industrialized countries in order to satisfy capital demands in Eastern Europe and in the South. The interest-rate sensitivity of world savings and investment behaviour thus plays a critical role in determining the end-result. This determinant is also crucial in global macroeconomic models used for policy analysis. The implications are discussed in section IV.B.

Another critical assumption of the above-mentioned framework is that all capital is allocated internationally through an efficient global capital market leading to an equation of the (expected) rate of return (interest rate) across countries and regions. Nobody will disagree that this is too simplistic to fit stylized facts. Access of developing countries and Eastern European countries to private capital markets is limited. Developing countries face a segmented capital market. Four dimensions are briefly assessed below: (1) official flows; (2) commercial bank lending; (3) direct foreign investment; and (4) 'capital flight' from the developing countries.

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[17] The argument is set out also in recent studies such as Collins and Rodrik (1991) and Pauly *Transfers, Real Interest Rates and Regional Development: International Economic Implications of Financial Support for the Economies in Transition*, Studies for the Group of Twenty-Four (1992).

1. Official capital flows

A large share of capital flows to LDCs is provided by official sources, i.e. by Governments of the industrialized countries and multilateral organizations: most of which (about three-quarters) at concessional terms. These flows can be seen as a reflection of the limited access to LDCs to private sources of external finance and are largely motivated by (geo-)political and humanitarian considerations rather than by rate-of-return differentials.

2. Commercial bank lending

The experience with commercial bank lending to developing countries over the past two decades has taught that banks ration borrowers from poor countries. Credit availability from this source for developing countries has been shown to be insensitive to interest rates. Imperfect information impedes banks from properly assessing (current and future) creditworthiness of borrowers and from differentiating with precision between risk groups of borrowers. Instead of applying a risk premium on interest rates, credit ceilings are applied to minimize the risk of default of borrowers.[18] Fairly uniform and broad categories of borrowers are usually distinguished in the oligopolistically structured bank loan market, with the lowest ratings for borrowers having the highest risk. Some borrowers, including most low-income LDCs, are entirely excluded from this market. However, the experience of the 1970s and 1980s has shown that this was not a static market. Flooded with liquidity (in part from the deposit investments accruing from savings surpluses of major oil exporters), banks raised credit ceilings for groups of LDCs and, encouraged by high commissions to be earned, engaged in an oligopolistic competition for market shares.[19] Mainly middle-income countries benefitted from the easing of market access. The fear of a widespread debt crisis following Mexico's payment problems in 1982 changed bankers' market perceptions rather abruptly, leading to a lowering of credit ceilings to practically zero for most LDCs. Thus, a rise in world interest rates, even if it led to an increased supply of global savings, would do little to enlarge the flow of bank loans to developing countries. The climate of extreme political and economic uncertainty, the lack of institutions and legal arrangements protecting property rights and other factors, will probably render very limited the access of the economies in transition in Eastern Europe and the republics of the former Soviet Union to the bank loan market.

3. Direct foreign investment

Direct foreign investment (DFI) in developing countries has also been limited and behaviour of multinationals is guided by more factors than simple straightforward calculations of rate-of-return differentials at the margin.[20] Political and economic uncertainties impede flows towards capital scarce economies. The share of DFI in total capital transfers to developing countries increased during the 1980s (from around 10 to 30 per cent), but this was, besides an increase in absolute terms, to a large extent due to the decline and stagnation in other sources of finance. Recent growth of DFI (and portfolio investment) has given rise to some optimism about the return of developing countries to private capital markets (e.g. IMF 1991c). A closer look at the data tempers this enthusiasm. Table 4 shows that DFI to LDCs increased quite consistently in real terms over the past two decades, but nevertheless they lost share in global DFI (from 22 per cent in the late 1970s to 15 per cent in the late 1980s). The average growth rate of DFI to LDCs in the second half of the 1980s was below that of the first half. It should be noted, however, that much of the recent growth took place after 1988, so that the figures for the most recent trends could be somewhat under-estimated in table 4. Growth has been highly concentrated, however. Seven countries (China, Thailand, Malaysia, Republic of Korea, Brazil, Mexico and Argentina) received two-thirds of the total flow of DFI to LDCs between 1986 and 1990. Asia has been the most successful region in attracting DFI flows (see table 5), which has been attributed to the comparative success of the economies in East Asia in terms of growth and macroeconomic stability, the maintenance of labour-cost competitiveness and liberalization of investment regimes (particularly in China).

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[18] There now exists a wide body of theoretical literature on the rationing behaviour of banks in domestic and international credit markets. See e.g. Stiglitz and Weiss (1981), Eaton, Gersovitz and Stiglitz (1986), and Vos (1991).

[19] See Darity and Horn (1988), Devlin (1989) and Vos (1991) on the 'loan pushing' and oligopolistic bank firm competition that characterized the lending behaviour towards LDCs in the 1970s.

[20] Cf. e.g. Dunning (1981) for an authorative view.

Much of this also relates to shifts in the international distribution of labour in export industries competing with Japan, but also is a result of firms and investors in the Republic of Korea and Taiwan Province of China moving capital to the 'newer NICs' in the region (Thailand, Malaysia, China, Indonesia). DFI flows to Latin America had declined during the first half of the 1980s as a consequence of the economic crisis and instability related to the debt crisis. Flows later recovered, particularly towards Brazil, Mexico, Argentina and Chile. Only Mexico and Chile have shown significant economic recovery and stability in recent years, which may have been a factor in attracting DFI. In these countries the privatization of public enterprises and debt-equity conversion programmes seem more important. A return of 'flight capital' of their residents (see also below) has been an important source of finance behind the recent growth of DFI to these countries. Some observers doubt whether much 'additional' DFI has been attracted, if any at all.[21] DFI flows to sub-Saharan Africa have been very small (except to Nigeria) and have tended to decline. DFI to Eastern Europe has been modest so far; this is not surprising given the political and economic uncertainties. In sum, LDCs have not been able to benefit proportionally from the recent worldwide growth of DFI. DFI has tended to concentrate in countries where foreign exchange constraints are the least likely. With the possible exception of some Latin American countries, DFI is not likely to become a major source of finance for the regions with high capital requirements in the 1990s.

4. *Private capital outflows from LDCs*

A final point regarding the functioning of the global capital market relates to the large private capital outflows from developing countries over the past two decades. This phenomenon popularly became known as 'capital flight'. Standard theory would expect that under efficiently working markets there would be a capital flow towards capital-scarce economies; not two-way flows. Obviously then, imperfections exist. The rationing of official capital flows and commercial bank credits has been alluded to above. Moreover, these flows have concentrated in the public sector of developing countries.[22] It has been argued that the growth of the public sector debt overhang has been a determinant of private sector capital outflows (e.g. Eaton 1987). The high capital inflows of the 1970s would have been a source of exchange rate overvaluation and public external debt would be perceived by investors as a senior type of asset over domestic assets. Fears for a major devaluation and the risk of taxation or expropriation of domestic asset holdings would be driving forces of capital flight. Empirical investigation of the issue is seriously hampered by measurement problems. This is not the place to discuss these concerns, but clearly estimates of the magnitude and trends in private capital outflows from developing countries tend to differ significantly depending on the method applied.[23] Table 6 gives some plausible aggregate estimates for 1975-1985. It suggests capital flight has been most serious in the indebted Latin American countries with average annual outflows of US$10 to 15 billion between 1978 and 1985. The cumulative outflow for the region has been, according to the figures in table 6, almost equivalent to 40 per cent of the increase in outstanding long-term external debt between 1975-1985. Although much smaller in absolute terms, the ratio of the stock of private foreign assets to outstanding debt appears even higher for Africa (43.6 per cent). Capital flight from Asia is reported to be much less significant, the highly-indebted Philippines being a notorious exception (Vos 1992a). Even if the margin of error is considerable, these estimates suggest many developing countries may be much less foreign-exchange constrained than is often assumed, if they can find ways to repatriate these private asset holdings.

Insight into the actual driving forces behind private capital outflows could assist in identifying ways to stimulate such repatriation. Empirical evidence about the determinants is

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[21] See Lagos (1992) on the case of Chile, who argues that net new DFI may have been less with the debt-conversion programme than it might have been without.

[22] Some 80 per cent of the external debt of developing countries is held by the public sector (see Vos (1991) for a more detailed analysis).

[23] See Anthony and Hughes Hallet (1992) and Vos (1992a) for recent discussions and comparison of measures using different methods.

Table 4

FLOWS OF DIRECT FOREIGN INVESTMENT

(Annual averages, US$ billion, 1989 prices) [a]

	1970-1974	*1975-1979*	*1980-1984*	*1985-1989*
Inward flows				
To high-income countries	35.8	37.5	56.6	102.3
To LDCs	8.6	10.9	14.4	18.3
Outward flows				
From high-income countries	54.7	63.6	58.4	135.7
From LDCs	0.5	1.0	1.7	1.9
Discrepancy inward-outward	-10.8	-16.2	10.9	-17.0
Shares (per cent) of inward DFI				
To high-income countries	80	78	80	85
To LDCs	20	22	20	15
Average annual growth rates (per cent) inward DFI				
To high-income countries		1.0	8.6	12.6
To LDCs		4.3	5.8	4.9

Source: IMF, *Balance of Payments Statistics Yearbooks*; Bachman (1991).
a Current US dollars deflated by G-7 MUV index.

not univocal, but depends on country cases and the applied method of measurement. Four major determinants stand out:[24] (a) the real exchange rate (or the expectation of a major devaluation); (b) the (exchange-rate adjusted) real rate-of-return differential between foreign short-term assets and domestic financial assets (this determinant was not found significant for private capital outflows from Africa); (c) the availability of external finance (rather than the debt overhang itself, as was hypothesized above), which has been explained as a factor 'fuelling' capital flight; and (d) a target stock of foreign assets which has been associated with simultaneous consumption and portfolio decision-making by private agents, international lifestyles and consumption patterns of the rich in developing countries requiring substantial foreign exchange holdings.[25]

This set of determinants does not provide a clear guide for policy advice, even apart from the fact that the situation should be assessed for each individual country. Exchange rate adjustment and a rise in domestic real rates of return could be achieved through a package of adjustment policies. What does matter is stable and sustained positive returns on domestic assets over time. The latter condition clearly has prevailed in large parts of East Asia with low levels of capital flight. Chile and Mexico only achieved a return of flight capital after at least half a decade of stabilization and structural adjustment policies and implementation of an attractive debt-conversion programme. Repatriation of foreign assets in the Philippines is also associated with debt-equity swaps. Large debt conversion programmes may have undesirable macroeconomic effects (monetary expansion, inflationary tendencies, and possible negative balance of payments effects)[26] when the economy is still going through a process of adjustment towards stability and economic recovery. The positive correlation between capital flight and foreign capital inflows may imply new capital transfers should be discouraged. In the

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[24] Econometric studies can be found in, among others, Cuddington (1986), mainly referring to Latin American countries; Pastor (1990) also on Latin America; Hermes and Lensink (1990) on Africa; Anthony and Hughes Hallet (1992) on four major Latin American countries and the Philippines; and Boyce (1990) and Vos (1992a) on the Philippines. See also Vos (1991) for a further comparison.

[25] This point is made in Cuddington (1986) and Vos (1991, 1992a).

[26] See e.g. Lagos (1992) and Corden and Dooley (1989) for discussion of such issues.

Table 5

FLOWS OF DIRECT FOREIGN INVESTMENT TO LDCs, BY REGIONS

(Percentage shares)

	1970-1974	*1975-1979*	*1980-1984*	*1985-1989*
Africa	16.6	15.1	6.7	6.6
Asia	23.3	24.0	35.9	48.5
Europe, Middle East, North Africa	5.4	3.7	6.7	11.6
Latin America and Caribbean	54.7	57.2	50.7	33.3
Total	100.0	100.0	100.0	100.0

Source: See table 4.

past, overborrowing as much as outright corruption of government officials diverting foreign loans to private ventures[27] have been vehicles for capital flight. Probably this should be seen in the broader context of the economic environment. Where new moneys assist economic stability and recovery, they may be supportive of a repatriation of foreign assets in the medium run (as in the case of Mexico).

The characterization of the four capital market segments leads one to conclude that, for most developing countries, prospects for new capital transfers in the 1990s do not look very bright.

(a) A resumption of voluntary commercial bank lending is not a realistic prospect for most LDCs. Net resource flows from this source are still negative for most countries.[28] Positive net flows have been restricted to some Asian countries, but a major contribution is not to be expected for the 1990s. At best the larger middle-income countries may regain some access depending on their success with adjustment efforts and the reduction of their debt overhang.

(b) DFI and renewed LDC access to international bond and portfolio markets[29] have concentrated in a very small number of the larger and richer developing countries. Again success in the adjustment effort may assist in attracting additional finance in the medium term. Smaller and poorer countries, even if they stabilized successfully (like Bolivia), simply lack resource endowments or basic economic and social infrastructure to attract such funds.

(c) Similarly, repatriation of foreign assets held by private agents is probably in most cases not an important source of finance during periods of stabilization and adjustment, but more likely it could be a source of finance for the expansion that follows successful adjustment.

(d) Official flows will be for most countries the residual, but most important source of external finance in the 1990s. A major constraint on these flows will be formed by the budget constraints of the Governments in the industrialized countries, as discussed above. The Governments in the major economies may not give high political priorities to the developing countries. Negotiations at UNCED in Rio de Janeiro (June 1992) once more confirmed the difficulties of getting firm commitments of the donor countries for additional finance. A weak restatement of the old DAC target

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[27] Obviously, not much hard documented evidence is available on this subject. Boyce (1990) gives a well-informed account for the Philippines.

[28] See table 3 and World Debt Tables 1991-1992 and IMF (1991c) for details.

[29] See IMF (1991c).

Table 6

PRIVATE FOREIGN ASSET ACQUISITION ('CAPITAL FLIGHT') [a] BY LDCs, 1975-1985

(Billions of current US$, average annual flows)

	I	*II*	*III*	*IV*	*V*
	1975-1978	*1979-1982*	*1983-1985*	*Increase in stock since end-1974*	*Increase in stock (col. IV) as a percentage of growth of debt outstanding*
All LDCs [b]	5.9	27.8	16.3	183.6	28.1
Africa	1.7	4.1	1.8	28.5	43.6
Asia	-0.8	7.0	-2.2	18.3	12.6
EMENA [c]	1.3	2.0	5.7	30.2	17.9
Latin America	3.7	14.7	11.0	106.6	38.9

Source: IMF, *Balance of Payments Statistics*; Deppler and Williamson (1987); World Bank, *World Debt Tables*.

[a] Private foreign asset acquisition defined as net change in private external claims and measured on the basis of balance of payments statistics as net change in external liabilities (short and long-term) plus net direct foreign investment less current account deficit and less the change in official reserves and foreign assets acquired by the official banking sector.

[b] Excluding offshore banking centres.

[c] Europe, Middle East and North Africa (excluding major oil exporters).

of 0.7 per cent of GNP was agreed on without any solid commitment of the donors to meet that target before the end of the decade. Rather, existing aid budgets have been under serious strain to redirect funds towards Eastern Europe. Italy, which expanded its aid budget significantly during the 1980s, has already made a large reallocation in this sense. The aid budget of the Netherlands, generally considered one of the more generous donors favouring low-income recipients, has become subject to a similar political debate, although no major diversions have taken place so far.

The prospects for satisfying from international financial resources the new capital demands of both Eastern Europe and the South are thus not very bright. A 'crowding out' of demands from either region (or parts thereof) is a plausible scenario. However, even if aid flows from the rich countries were more forthcoming, it may be questioned whether this would have a favourable impact on the world economy as a whole and the developing countries, in particular, given the global capital market conditions discussed in section I above. This issue is treated in the next section.

IV. Global interactions

The global economic balances have shifted markedly over the past quarter of a century, as noted in section I. Throughout the 1990s and into the twenty-first century further major shifts seem to lie ahead. As also noted in section I, savings rates in the Northern economies are likely to decline in the medium to long run. This will put pressure on major fiscal adjustments in the Northern economies; otherwise higher and more unstable interest rates, lower private investment demand and growth are likely to dominate the global adjustment process. New capital demands for Eastern Europe, developing countries and the global environment will create pressure for further major shifts in global macroeconomic balances, even if the most modest estimates are taken (section II). Despite the return of some developing countries to private international capital markets, the role of private flows in satisfying the new demands is expected to be small and restricted to a limited number of countries. Demands for official and concessionary finance will thus put further pressure on the government budgets of the industrialized countries. A first plausible scenario is that budgetary problems in the rich countries will crowd out the finance needed for the global environment, development of the poor countries and capitalist reform in the former socialist countries. A second scenario could be that some new public money is made available, but accompanied by larger fiscal deficits and a crowding out of private investment demand in the industrialized countries. The aid-receiving countries in the developing world could eventually lose if financial instability and recessionary tendencies subsequently hit the world economy.

Why such pessimism? Would not new capital transfers stimulate trade and growth in the finance and foreign-exchange constrained economies with positive feedbacks on growth and savings elsewhere? Could the global adjustment process not be eased by looser monetary policies in the major economies, i.e. offsetting the upward pressures on real interest rates and recessionary tendencies? To answer these questions a global model is required. There is no consensus on the appropriate structure of such a model. Instead of presenting one particular model, outcomes of different types of existing models are compared. Section A below isolates the effects of an exogenous increase in capital transfers on international trade eastward and southward. Section B assesses the outcomes of several global macroeconomic models that focus on savings-investment and financial market linkages between the major economic regions of the world and the developing countries.

A. Aid transfers and trade linkages

The debt problem has brought the financial interdependence between industrialized and developing countries to the fore, but trade remains of course an important element in North-South relations. In 1987, industrialized countries exported about 2.7 per cent of their output to developing countries, while imports from them were about 3.1 per cent of industrialized country GDP. In 1980 ratios for both exports and imports were 3.9 per cent. The decline was mainly due to the fall in fuel and commodity prices in the 1980s (table 7). The traditional paradigm is that of developing countries as exporters of primary commodities and importers of manufactures. The share of manufactured exports in total exports of developing countries has increased significantly over the past two decades. Table 7 shows that manufactured imports from LDCs as a share of the GNP of industrialized countries increased four-fold since 1970, while total import coefficient increased by 50 per cent. Manufactured exports from industrialized countries to developed countries almost doubled as a proportion of industrialized country GDP between 1970 and 1980 (from 2.2 to 3.9 per cent), but fell during the 1980s. The latter trend is clearly linked to the debt crisis and the drying up of net financial transfers to developing countries and the import compression that formed part of the adjustment process many developing countries were forced to follow.

This raises the classic question of the relationship between trade and capital transfers and the extent to which trade and growth are stimulated world-wide by capital movements. The optimistic view, voiced some time ago (for instance in the Brandt Commission Report (Brandt 1980)), is that aid and capital transfers to developing countries would lead to higher global welfare as they would increase import capacity of these countries, enhance their growth potential and thus have a positive feedback on other countries through trade expansion. The underlying reasoning is based on extreme (Keynesian) assumptions, that is, a fully demand-driven global adjustment process and no endogenous price or interest rate effects.[30] There is a vast international economics literature showing welfare outcomes may be ambiguous once price and factor payment effects are accounted for.[31] The empirical relevance of the terms-of-trade, interest rate and financial market dynamic effects will be assessed through a number

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[30] See also Jayarwardena (1983) on this type of global Keynesianism which had many advocates at least until the early 1980s.

[31] See e.g. Eaton (1989) and Vos (1991) for surveys of this literature starting with the classic transfer debate.

Table 7

TRADE FLOWS BETWEEN INDUSTRIALIZED AND DEVELOPING COUNTRIES

	1970	1980	1987
		In billions of US$	
Exports of ICs to LDCs	48.1	304.1	334.7
Manufactures	39.2	243.1	277.5
Non-oil primary commodities	8.1	53.6	49.9
Oil	0.7	7.4	7.4
Imports of ICs from LDCs	42.5	313.4	390.0
Manufactures	8.6	91.1	217.9
Non-oil primary commodities	26.0	93.1	97.2
Oil	7.9	129.2	75.0
		In per cent of ICs GNP	
Exports of ICs to LDCs	2.2	3.9	2.7
Manufactures	1.8	3.1	2.2
Non-oil primary commodities	0.4	0.7	0.4
Oil	0.0	0.1	0.1
Imports of ICs from LDCs	2.0	3.9	3.1
Manufactures	0.4	1.2	1.7
Non-oil primary commodities	1.2	1.2	0.8
Oil	0.4	1.6	0.6

Source: Masson and Helliwell (1990) based on United Nations trade matrices.

of global macroeconomic models discussed in section B below. This section isolates the demand effects resulting from alternative allocations of increased net financial transfers from North to South and from North to East. It assesses the effects on world trade and the distribution of welfare effects over different country groups under varying assumptions about the way in which resources are mobilized in the industrialized countries in order to effectuate the increased transfers.

The analysis uses a simple linear world model based on a World Accounting Matrix (WAM). The WAM is a global accounting and data system which connects the external transactions (trade, finance and factor payments) of each economy with the internal balance (as reflected in the savings-investment balance) and identifies the interactions through commodity and financial markets between economies.[32] By presenting the accounting relations in matrix form the origin and destination of each international transaction can be identified. This of course requires a systematic cross-check of the consistency of data on commodity trade, balance of payments and national accounts across countries. The end result is a WAM which provides fully reconciled data for the world economy and includes mostly well-founded adjustments for the large world current account discrepancy which was pointed out earlier in section I.

A reconciled WAM for 1985 is included in annex table A1.3.[33] The WAM is based on a ten-region classification: four groups of industrialized countries (United States, Japan,

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[32] The structure and basic accounting principles of the WAM are explained in Vos (1992b) and in a special Appendix to this paper which is available from the author upon request.

[33] The WAM was constructed as part of a larger project on world accounting undertaken by the Finance and Development Research project of the Institute of Social Studies. WAMs with the same country group classification as annex table A1.3 have been constructed for 1970, 1975 and 1980 as well. See Luttik (1992) for all details. Currently, a series

European Community and Other OECD); one region for Eastern Europe and the former Soviet Union (former CMEA); one region of major oil exporters (MOE); three developing country regions classified by the nature of their external financial dependence (LDC-OB, DB and PB); and one region for the remaining countries of the rest of the world. A separate account for multilateral organizations (United Nations, IMF, World Bank, etc.) has been included as well. The classification for the developing countries was derived from the hypothesis that developing countries face a segmented world capital market, with some (mainly low-income) countries being heavily dependent on finance from official sources (i.e. 'official borrowers', LDC-OB) and others (mainly middle-income) with potential access to private sources of external finance ('private borrowers', LDC-PB). Countries with a more mixed external financing structure were labelled as diversified borrowers. WAMs with a country classification closer to those applied for the data presentations in the previous sections are still in the process of being constructed.[33] Roughly speaking, however, LDC-OB mainly consists of the low-income countries in sub-Saharan Africa and South Asia, while LDC-PB features most Latin American countries, most of East Asia and Nigeria and Zimbabwe in Africa.

Accounts 1-11 (annex table A1.3) represent consolidated current account transactions (merchandise trade, services, factor payments, current transfers) reading exports and factor incomes on the rows and imports and factor payments in the columns. Accounts 13-22 identify for each country group national savings and net increase in external liabilities (capital inflows) on the rows and domestic investment and acquisition of foreign assets (capital outflows) in the columns. Accounts for private and public consumption (23, 24) and change in reserves complete the system. (See Vos 1992b for further details and accounting identities.)

The WAM can be used as a basis for a linear model after separating endogenous and exogenous accounts. The method resembles the fixed-price multiplier model applied to Social Accounting Matrices (cf. Pyatt and Round 1979). For the present purposes, the regional current accounts (1-10) and private consumption (23) have been defined as endogenous (to changes in regional incomes). Multipliers were derived after estimating volume marginal import propensities and marginal consumption propensities.[34] Income changes as a result of exogenous demand injections (e.g. resulting from aid and capital transfers) can be estimated as:

$$dy = C\,dy + dx = (I - C)^{-1}\,dx$$

where C is the matrix of marginal propensities and dy and dx are changes in the endogenous and exogenous incomes respectively. The WAM model thus seems to be a quite appropriate tool to assess the global impact of increased aid transfers from North to South along the lines sketched by the Brandt Commission report. The model reproduces the extreme Keynesian assumptions of the report.

Twelve policy experiments are reported below. All simulations refer to the same aggregate transfer increase: development assistance flows to LDCs are increased to the level of the DAC target of 0.7 per cent of the GNP of the donor countries (i.e. doubled from the current level of 0.35 per cent). This 'injection' into the world economy compares to the lower bound estimate of financial requirements for developing countries in the 1990s discussed in section II (equivalent to about 0.4 per cent of industrialized countries' GNP). Of interest here, however, is the sensitivity of income changes to the allocation of these aid transfers among developing countries and to the type of budget-sharing in the industrialized countries.

At 1985 prices and exchange rates, the simulated additional financial transfer amounts to US$32 billion. Given their actual aid performance in 1985, this transfer will have to be generated among the OECD countries with the following distribution (in billions of US$):

United States	18.7
Japan	5.5
EC	6.1
Other OECD	1.7
Total	32.0

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of WAMs for 1985-1990 is being constructed using a 23-country group classification based on geographic criteria (G-7 countries are separate). See De Jong, Vos and Jellema (1991) for preliminary results.

[34] The marginal import propensities were estimated based on United Nations trade matrices series for 1968-1987. Detailed results are reported in Izurieta and Vos (1992). See also annex table A.2.

The twelve policy simulations differ by allocation among the LDC groups, the degree of diversion of aid flows to Eastern Europe and the way of financing in the OECD countries:

Ia: All aid is allocated to the low-income countries (LDC-OB) and no demand deflation (i.e. no budget constraint) in the OECD countries;

Ib: As Ia, but there is demand deflation (i.e. an imposed budget constraint) in the OECD countries;

IIa: Aid is more or less evenly distributed among the LDC country groups and no demand deflation (i.e. no budget constraint) in the OECD countries;

IIb: As IIa, but there is demand deflation (i.e. an imposed budget constraint) in the OECD countries.

IIIa: The entire increase in aid budgets is diverted to Eastern Europe and the former Soviet Union (CMEA) and no demand deflation (i.e. no budget constraint) in the OECD countries;

IIIb: As IIIa, but there is demand deflation (i.e. an imposed budget constraint) in the OECD countries;

IVa: Half of the increase in aid budgets is diverted to Eastern Europe and the former Soviet Union (CMEA) and the other half is entirely allocated to LDC-OB and no demand deflation (i.e. no budget constraint) in the OECD countries;

IVb: As IVa, but there is demand deflation (i.e. an imposed budget constraint) in the OECD countries;

Va: One-third of the increase in aid budgets is diverted to Eastern Europe and the former Soviet Union (CMEA) and the rest is entirely allocated to LDC-OB and no demand deflation (i.e. no budget constraint) in the OECD countries;

Vb: As Va, but there is demand deflation (i.e. an imposed budget constraint) in the OECD countries;

VIa: One-third of the increase in aid budgets is diverted to Eastern Europe and the former Soviet Union (CMEA) and the rest is distributed among the different LDC groups and no demand deflation (i.e. no budget constraint) in the OECD countries;

VIb: As VIa, but there is demand deflation (i.e. an imposed budget constraint) in the OECD countries.

In the case of the developing countries the optimistic assumption is applied that indeed the entire transfer will lead to an increase in expenditures. Some would even argue that aid tends to be even more expansionary, leading to complacency in the tax effort and more than proportionally increases government expenditures (Cf. e.g. Griffin 1970, 1986). A more pessimistic assumption from the perspective of global demand effects would be that developing countries apply balance-of-payments targets, e.g. as part of an adjustment programme agreed with the IMF or World Bank, and try to avoid a further widening of the external balance and thus cut domestic (government) spending to meet the external balance target. This case is not considered here.

With regard to the budget constraints of industrialized country Governments, two assumptions are applied. In one there are no financial constraints and in another the donor Governments pursue deflationary policies to effectuate the additional aid transfer. The first case is probably more in line with 'true' global Keynesianism in that the aid transfer is effectuated through (non-inflationary) deficit financing and demand effects. The crucial issue is that the international aid transfer not only has implications on the expenditure side of the government budget, but also requires a current account surplus (i.e. a savings surplus) in order to be effectuated. The simulations try to isolate this 'transfer problem' by assuming that in the case of no financial constraints (cases A) the transfer has no implications for aggregate government expenditures (i.e. the higher aid budget is funded from a budget reallocation), so that the exogenous demand effects in the OECD countries are zero. The implication is that the required savings and current account surplus will have to be generated through Keynesian income adjustment originating from the demand effects created in the aid-receiving countries. Obviously, these effects are immediate in the case of fully tied aid.

In the case with financial constraints (cases b), it is assumed that the donor Governments pursue deflationary policies to effectuate the aid transfer *ex ante* and negative exogenous demand injections are imposed on the four OECD economies of the size equal to the additional aid transfer that each is required to make to meet the DAC target. The simulation results are shown in table 8. The results are highly suggestive.

(a) Clearly a 'true' Brandtian global Keynesianism of mutually reinforcing aid, growth and trade seems possible in the cases in which the neglect of financial constraints can go unpunished (cases a). The highest endogenous world income growth is achieved, surprisingly enough, in the case in which the entire aid transfer is allocated to the low-income, aid-reliant countries (LDC-OB). Global income growth is about 1.1 per cent, which is three times the size of the exogenous demand injection. This might suggest that a potential 'virtuous circle' exists between world income redistribution towards the poorest nations and global economic growth. The result is surprising, given the rather low marginal import propensities of these countries.[35] However, a higher marginal consumption propensity than elsewhere and high indirect spending effects on the United States economy, which also has a lower marginal savings rate than the other major economies,[36] lead to the observed strong trade and income multipliers of this group of countries.

(b) Further, the aid transfer generates strong redistributive effects in favour of the aid recipient countries. Among the donor countries, the EC tends to be the largest beneficiary in the case with no financial constraints and all aid flowing to LDC-OB (Ia). This is remarkable in the light of the earlier observation that the United States showed higher multiplier linkages with the developing countries than any of the other industrialized country groups. The final result may be explained by larger overall international linkages of the EC. However, the outcome is somewhat different if the aid transfer is more evenly distributed among the LDCs (case IIa), as this seems to lead to slightly lower income effects in the United States and the EC, making Japan the main beneficiary among the donor countries.

(c) If the donor countries pursue deflationary policies to effectuate the aid transfer, world income growth is strongly depressed. The donor countries plunge into a recession, and the income effects in the rest of the world are severely dampened. For the world as a whole, this way of financing the aid transfer is almost a zero-sum game as world income growth is negligible (i.e. near zero) and smaller than the size of the transfer. The trends and distributive effects are similar to the case without financial constraints.

(d) Diversion of aid transfers to Eastern Europe generates lower income effects (simulations IIIa versus I-IIa). Global income effects improve the more aid is allocated to low-income LDCs (IV-VIa). If there is diversion towards Eastern Europe and the additional aid transfers are financed out of demand deflation in the industrialized countries, non-recipient countries may even suffer welfare losses (IVb, VIb). These effects are of course based on the historical spending behaviour of the former CMEA countries showing relatively low domestic demand multipliers and less integration into the global trading system. These conditions are now subject to change. Likely the transformation process will be slow, so that estimated multipliers may remain of some relevance in the medium run.

As indicated, the linear WAM model isolates demand effects, but ignores endogenous price effects and endogenous global financial interactions. It would be hazardous to draw strong policy conclusions from such a model system, even though the model conclusions may

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[35] Bilateral marginal import propensities (out of real income) are not significantly different from zero for most trading partners, suggesting import demand is foreign exchange constrained for this group of countries rather than that income growth feeds back into trade.

[36] See Izurieta and Vos (1992, forthcoming) and a special appendix to this paper which is available from the author upon request.

Table 8

WAM-MODEL 1985: POLICY SIMULATIONS INCREASE IN AID TRANSFERS TO REACH DAC TARGET OF 0.7 PER CENT OF GNP

Exogenous demand injections (US$ billion)

		Original income	*Ia*	*IIa*	*Ib*	*IIb*	*IIIa*	*IVa*	*IIIb*	*IVb*	*Va*	*VIa*	*Vb*	*VIb*
United States	1	4463	0.0	-18.7	0.0	-18.7	0.0	-18.7	0.0	-18.7	0.0	-18.7	0.0	-18.7
Japan	2	1506	0.0	-5.5	0.0	-5.5	0.0	-5.5	0.0	-5.5	0.0	-5.5	0.0	-5.5
EC	3	3518	0.0	-6.1	0.0	-6.1	0.0	-6.1	0.0	-6.1	0.0	-6.1	0.0	-6.1
OOECD	4	1215	0.0	-1.7	0.0	-1.7	0.0	-1.7	0.0	-1.7	0.0	-1.7	0.0	-1.7
CMEA	5	951	0.0	0.0	0.0	0.0	32.0	32.0	16.0	16.0	10.0	10.0	10.0	10.0
MOE	6	545	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OB	7	539	32.0	32.0	11.0	11.0	0.0	0.0	16.0	16.0	22.0	22.0	10.0	10.0
DB	8	682	0.0	0.0	11.0	11.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	6.0
PB	9	1103	0.0	0.0	10.0	10.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	6.0
ROW	10	281	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C_p	23	7418	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total		22221	32.0	0.0	32.0	0.0	32.0	0.0	32.0	0.0	32.0	0.0	32.0	0.0

Simulation results (per cent change in endogenous income)

		Ia	*IIa*	*Ib*	*IIb*	*IIIa*	*IVa*	*IIIb*	*IVb*	*Va*	*VIa*	*Vb*	*VIb*
United States	1	0.80	-0.25	0.65	-0.40	0.42	-0.62	0.61	-0.43	0.68	-0.36	0.60	-0.45
Japan	2	1.30	-0.10	1.07	-0.33	0.69	-0.72	0.99	-0.41	1.11	-0.30	0.98	-0.43
EC	3	0.47	-0.11	0.38	-0.20	0.25	-0.33	0.36	-0.22	0.40	-0.18	0.35	-0.23
OOECD	4	1.14	0.07	0.92	-0.15	0.60	-0.47	0.87	-0.20	0.97	-0.10	0.85	-0.22
CMEA	5	0.88	0.19	0.71	0.02	3.83	3.14	2.35	1.67	1.80	1.11	1.70	1.02
MOE	6	0.90	0.20	0.73	0.03	0.49	-0.20	0.69	0.00	0.77	0.07	0.68	-0.02
OB	7	6.26	6.02	2.29	2.05	0.17	-0.07	3.21	2.98	4.36	4.12	2.08	1.85
DB	8	0.64	0.12	2.13	1.60	0.34	-0.19	0.49	-0.04	0.55	0.02	1.36	0.83
PB	9	0.26	0.04	1.13	0.91	0.14	-0.08	0.20	-0.02	0.22	0.00	0.75	0.53
ROW	10	-0.14	-0.06	-0.14	-0.06	-0.12	-0.04	-0.13	-0.05	-0.13	-0.05	-0.13	-0.05
C_p	23	1.32	0.29	1.06	0.04	0.70	-0.33	1.01	-0.02	1.12	0.10	0.98	-0.05
Total		1.07	0.19	0.89	0.02	0.63	-0.24	0.85	-0.03	0.93	0.05	0.83	-0.05

Note: See text for description of simulations and annex table A1.3 for description of account names.

be helpful as partial answers. Looking at the global demand effects of additional aid transfers, the above simulations suggest that the highest positive gains, both in terms of global income effects and in terms of income redistribution towards the poorest nations, may be expected if additional aid transfers are directly allocated towards these countries. Diversion towards Eastern Europe would imply lower global income effects. This is only part of the story, however. In the next section a more complete picture is drawn, taking account not only of trade-income multipliers but also of endogenous price effects and endogenous financial linkages.

B. Trade, aid and finance in global macroeconomic models

1. Models emphasizing trade linkages

Considerable empirical macroeconomic research has been done on the current account and fiscal linkages among the industrialized countries (Bryant *et al.* 1988), but much less empirical analysis using multi-country general equilibrium models of the linkages between industrialized and developing countries. Much of the traditional literature on interactions between North and South has been concerned with trade and with growth and development of the South.[37] Empirical models of the world economy including the developing countries have emphasized trade linkages.[38] The better known model systems include Leontief's regional world model, the World Bank's SIMLINK, OECD's INTERLINK, Project LINK and the FUGI model.[39] These models have in common the fact that international linkages are determined through trade matrices. The Leontief regional input-output system assumes fixed prices, but the other systems specify market-clearing price adjustment for various commodities. Linkages between North and South thus not only depend on income growth and demand functions for each other's exports, but also on terms of trade effects. Another noteworthy common feature of these models is that they assume developing countries are foreign-exchange-constrained economies. That is, developing country growth and demand for industrialized countries' exports are constrained by import capacity, i.e. export earnings plus capital inflows.

Capital flows and global financial interactions are not explicitly modelled in these systems.[40] Usually capital flows from industrialized to developing countries are set exogenously thus determining their import capacity. Net capital movements between other countries and regions are equated with their respective net trade or current account balances that result from general equilibrium income and price effects.

These models have been used among other things to project trends in world economic growth, trade and commodity prices under different policy assumptions. They have also been used to estimate capital requirements for developing countries for specified growth targets, i.e. providing a global framework for the type of two-gap model estimations discussed in section II above. They can also be used to assess the effects of increased aid flows and alternative allocations as done above using the WAM-multiplier model. Some simulation excercises using the Project LINK model system are discussed below. Gregory (1992) reports on some recent simulations of the global effects of a doubling of Japanese aid using the FUGI model. These simulations confirm the sensitivity of the size and distribution of global welfare effects following increased aid transfers to the way these are financed in the donor countries and how these are allocated among developing countries.

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[37] See Findlay (1984) and Ocampo (1986) for reviews of that literature.

[38] See Hickman (1987) for a good review.

[39] See Leontief *et al.* (1977) on the Leontief regional world model; Hicks *et al.* (1976) and Waelbroeck and Tims (1982) on SIMLINK; OECD (1982) and Richardson (1987) on INTERLINK; Filator, Hickman and Klein (1983) and Hickman (1987) on the country models and global linkage system coordinated through the project LINK; and Onishi (1981) on the FUGI model.

[40] The FUGI model does model private direct investment abroad, which is a function of the level of GDP, the share of profits, wage costs (adjusted for labour productivity) relative to the world level, and exchange rate movements, all variables of the debtor country. Also portfolio investment is modelled explicitly as a function of interest rate differentials between capital-importing and exporting countries, exchange rates, and profit shares.
The level of ODA flows is given as a fixed proportion of donor country GDP, while also the allocation across LDCs is set exogenously. The overall trade and current account adjustment is eventually no different from that explained in the text, i.e. the remaining other capital flows accommodate trade and current account imbalances.

Table 9 summarizes the results. It shows that:

(a) A 'budgetary neutral' aid increase (financed through cut-backs on other government expenditures, defence in particular) yields a small, but positive global welfare effect: global GDP would increase by 0.023 per cent, less than the original injection. The initial injection is about US$10 billion (doubling of existing Japanese ODA) or about 0.04 per cent of world GNP. The implicit trade-income multipliers assumed by the FUGI model thus appear smaller than those calculated by the WAM-multiplier model, which may have to do with the inclusion of endogenous price effects.

(b) Much of the positive world growth effect disappears if the Japanese aid increase is financed through demand deflation (via a tax increase). The model suggests GDP growth in the OECD countries would fall and thus reduce income growth effects for the developing countries.

(c) Global growth remains positive if the existing East-Asian concentration in the allocation pattern of Japanese aid is maintained (with Indonesia, China, Philippines and Thailand receiving almost half). Contrary to the findings of the WAM model trade multipliers, a bias in the allocation towards the low-income countries (China, India and Africa receiving about two-thirds) yields a global welfare loss if financed by increased taxation. This outcome has to do with (i) the model's parameter assumptions showing lower growth responses to increased capital inflows in India and China than Indonesia, Philippines and Thailand; (ii) the new geographical distribution of aid which is applied to the entire Japanese budget, meaning that, compared to the baseline, aid flows towards the dynamic East-Asian economies are actually reduced; and, likely, (iii) unfavourable terms of trade effects (not included in the WAM model) following demand deflation in the OECD countries appear stronger for (primary-exporting) low-income countries.[41]

The differences in results between the FUGI and the WAM model underline the importance of carefully checking the structure of the model before using simulation results as a guide for policy-making. They also show that there is still considerable scope for debate about the empirical validity of the precise multipliers determining size and direction of the key international economic linkages.

2. *Global macroeconomic models emphasizing financial linkages*

Over the past decade, much more empirical work has been done on the analysis of global macroeconomic interactions. The growth of international financial markets has emphasized the important international repercussions of fiscal and monetary policies. Private capital flows (bank credits) to developing countries also grew, but at the same time the crisis in their ability to service their debts in the 1980s affected their access to these flows and hence their import capacity. This makes clear that capital flows have their own determinants and that finance may be driving trade balance adjustment rather than vice versa.

Very few empirical global general equilibrium models capture capital flows and macroeconomic linkages between industrialized and developing countries. Much of the research has been confined to linkages between the industrialized countries (see e.g. Bryant *et al.* 1988). Discussion of recent work on rather aggregate models of North-South macroeconomic interactions can be found in Currie and Vines (1988), Vines and Muscatelli (1989) and Vos (1991). Only a few models will be discussed here. They could be seen as representative of the state-of-the-art. The main focus will be on the IMF's MULTIMOD (Masson, *et al.* 1988; Masson, Symansky and Meredith 1990; IMF 1991d) and the MSG2 model developed by McKibbin and Sachs (1991). MULTIMOD is an important tool for the policy analyses underlying the IMF's world economic outlook. MSG2 was sponsored by the Brookings Institution. To highlight the relevance of certain theoretical assumptions, further reference is

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[41] The price effects are not explicitly discussed in Gregory's assessment.

Table 9

FUGI MODEL: GLOBAL IMPACT OF DOUBLING JAPANESE AID FLOWS

(Change in GDP growth rates vis-à-vis baseline, in percentages)

		Existing aid allocation		*Aid biased to LICs*
	Baseline GDP growth rate	*Budget neutral* *I*	*Tax increase* *II*	*Tax increase* *III*
World	3.0	0.023	0.010	-0.003
OECD	2.7	0.003	-0.009	0.000
Japan	4.0	0.006	-0.064	0.000
Asia	5.7	0.253	0.241	-0.043
East Asia	6.0	0.025	0.013	-0.004
Indonesia	5.1	1.820	1.775	-0.561
China	4.8	0.021	-0.014	-0.003
India	4.8	0.020	0.019	0.082
Africa	n.a.	n.a.	n.a.	n.a.
Egypt	2.5	0.002	-0.001	0.002
Nigeria	5.5	0.002	0.002	0.004
Other Africa	3.3	0.000	0.000	0.000
Latin America	n.a.	n.a.	n.a.	n.a.
Brazil	4.6	0.004	0.000	0.000
Mexico	3.9	0.002	-0.003	0.000
Other Latin America	3.7	0.000	0.000	0.000

Source: Gregory (1992), preliminary results.

Note: Doubling Japanese aid is equivalent to exogenous injection of about US$10 billion (1990) or about 0.04 per cent of world GNP and 0.06 per cent of OECD GNP.

Scenarios:

I: Aid increase financed through budget cuts (defence expenditures); allocation according to 1989 Japanese aid allocation.

II: Aid increase financed through tax increase; allocation according to 1989 Japanese aid allocation.

III: Aid increase financed through tax increase; allocation biased towards low-income countries on the basis of income gap with respect to "low income threshold" of US$1380 in 1988; reallocation confined to current aid recipients.

made to a small North-South model (STAC) which, in the tradition of the theoretical literature, assumes rather strong structural behavioural differences in trade and financial adjustment between the two regions. Further, some reference will be made to the large LINK project model system which connects about 80 country models. Rather than being comprehensive, the main purpose of this comparative analysis is to undo empirical global models from the 'black box' vignette these have in the minds of many policy-makers.

Both MULTIMOD and MSG2 differentiate the major industrialized countries. They have a simple aggregate country model for high-income oil producers and have grouped all net debtor developing countries into one region. Trade of developing countries is disaggregated into three types of commodities: oil, other primary commodities and manufactures. This way the importance of terms of trade changes is captured, as well as the reality that developing countries not only export primary products but also manufactures. The STAC model has only one aggregate industrialized country model, but also distinguishes a major oil-exporters region and one aggregate developing country region. In contrast to the other two models, it assumes complete trade specialization between the regions in the tradition of the theoretical North-South literature: the North producing and exporting manufactures; the South primary products.

The key assumptions determining the global linkages captured by these models may be summarized as follows:

- ***Prices and terms of trade:*** Prices are fully flexible on all markets in the MSG2 model. In both MULTIMOD and STAC the price of oil is fixed, primary commodity prices are flexible and market-clearing, while producers of manufactures are assumed to exercise a considerable degree of market power. The price of manufactures is thus determined by a mark-up pricing rule over production costs. In MULTIMOD each country (region) can price its manufactured good differently. In STAC, given complete specialization, these assumptions make the North a fixed-price, demand-driven economy and the South a supply-constrained economy vulnerable to commodity price fluctuations. Although less straightforward, this asymmetry is also apparent in MULTIMOD as developing countries turn out to be, on balance, net primary exporters.

- ***Private savings and investment:*** The modelling of the industrialized economies in MSG2 and MULTIMOD follows the basic outline of a dynamic version of the Mundell-Fleming model for open economies, but allows for rational expectations in determining portfolio behaviour in financial markets. Private savings are determined through household-consumption demand, which is a function of current income growth, net wealth and (in MULTIMOD only) also demographic change. This savings behaviour relates to the discussion in section I.B. The real interest rate affects expected future consumption, the discounted value of wealth and the propensity to consume out of wealth. Higher interest rates are expected to reduce current consumption and thus enhance private savings. STAC in contrast assumes a post-Keynesian savings function, making private savings insensitive to interest rate changes and rather a function of income distribution and firms' self-financing decisions. Equally in STAC, Southern private savings are a function of income distribution (with profits driven by the terms of trade). In MULTIMOD, developing country savings depend on disposable income. MSG2 does not specify a Southern savings function. The determination of investment demand in the industrialized countries runs down in all three models being a positive function of firm profitability and depending negatively on the real interest rate (through Tobin's q framework). Southern investment and output are also treated similarly in all three models as being finance-constrained (by domestic and foreign savings).

- ***Capital flows:*** MULTIMOD, MSG2 and STAC all assume that the global capital market is segmented. This is very much in line with the argument in section III, although it is noted that MULTIMOD and MSG2 only model one aggregate type of capital transfer to the South (with specific reference to commercial bank lending), while STAC models aid transfers, bank credits and 'capital flight'. In all three models, Northern investors have unconstrained access to finance, but Southern Governments and private investors are constrained by credit rationing rules. McKibbin and Sachs simply set the scale of borrowing by LDCs exogenously under the assumption that the amount of loans available to these countries is rationed by considerations of country risk. In MULTIMOD, financial flows between industrialized and developing countries are assumed to depend on LDC ability to service debt. The measure of payment ability is the interest payments-to-export ratio evaluated at expected real interest rates and exports in the future. Because of forward-looking elements, this ratio is seen as a measure of solvency rather than of liquidity. No demand function for loans is specified, but it is implicitly assumed that borrowers apply exactly the same solvency criterion to manage their external debt. They are further implicitly assumed to honour faithfully debt contracts and allow a negative transfer if new lending falls short of payment obligations. The possibility of default is not considered. In STAC a debt crisis may occur because lenders and borrowers behave differently. Lenders apply a solvency criterion to assess creditworthiness (based on LDCs' debt/export ratio), as in MULTIMOD, but are also assumed to raise credit ceilings for LDC borrowers if the international banking systems tends towards excess liquidity.[42] Creditors cannot be expected to be able to predict with any precision future interest rates and LDC export earnings, so that their creditworthiness assessment is imperfect. LDC borrowers (mainly governments) are seen to manage debt rather as a form of foreign reserve management (liquidity needs) than with an eye on solvency. If debt servicing surpasses a critical percentage of foreign exchange earnings, they will consider (partial) default. In STAC an actual debt crisis may result; an option not considered by the other models. The STAC model also considers 'capital flight', i.e. acquisition by private agents of assets in industrialized countries. This capital flow from South to North is assumed to be determined by exchange rate adjusted rate-of-return differentials between domestic and foreign assets and asset targets, thus partly reflecting the type of determinants discussed in section III.

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[42] This way of modelling lenders' behaviour rests on a theory of oligopolistic competition between bank firms which try to maximize market shares under restrictions of (imperfect) creditworthiness assessment. See also the discussion in section III.

What global adjustment effects do these models predict in response to an increase in capital flows to developing countries? The short answer is that these will depend on the macroeconomic policies in the industrialized countries accompanying the additional transfer. The direct effect of enhanced capital flows on income growth is positive, as these models assume developing country investment and growth is foreign- exchange constrained. However, this positive effect may be fully offset as soon as global general equilibrium effects are taken into account. The key linkages are summarized in table 10. Given the structure of these models, the key variables determining the outcome for growth in the developing countries are:

(a) GNP growth in the industrialized countries (Y_{oecd}), which is the main determinant of demand for LDC exports (and import capacity).
(b) World interest rate (r), which affects the savings-investment process as well as the growth rate in the major economies and affects the debt service burden of the indebted developing countries and so their import capacity, growth, access to new lending (MULTIMOD) and probability of default (STAC).
(c) The terms of trade (tot) of the developing countries which is an important determinant of their export earnings and domestic savings (MULTIMOD, STAC).
(d) GNP growth rate of developing countries (Y_{ldc}) which has a feedback on the terms of trade (supply effect) and LDC savings.

Table 10 summarizes the signs of the adjustment of these key variables for a few relevant and comparable simulations executed with these models. The effects are shown for the short-run (1-year simulation) and medium-run (5-year simulation). The outcomes are broadly similar:

(a) *OECD fiscal expansion*[43] *(bond-financed, i.e. with unchanged monetary policies)*

In the short-run, MSG2 and MULTIMOD predict aggregate demand expansion in the North and an increase in real interest rates. In MULTIMOD, the spill-over effect on LDCs is initially positive: Northern expansion increases demand for LDC exports, leading to a terms-of-trade improvement and higher growth. However, in the medium run these positive effects disappear as higher interest rates have a negative impact on aggregate demand in the North, eventually leading to a fall in the terms of trade and lower growth in both North and South. McKibbin and Sachs do not report welfare effects for the South, but OECD growth and the terms of trade should be indicative. In year-5, similar results are obtained as with MULTIMOD; in year-1 a terms of trade deterioration is reported[44] suggesting an ambiguous effect on the Southern growth rate. In the STAC model, the negative repercussions on global demand and Northern investment are immediate, suggesting the fiscal impulse resulting from increased aid budgets may even lead to welfare losses in the South in the short run.

(b) *Alternative ways of financing the aid increase*

(I) Bond-financed

This way of financing the aid increase shows global adjustment effects similar to

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[43] The table refers to the effects of United States fiscal expansion, but a combined fiscal expansion in the major OECD countries yields similar overall outcomes.

[44] This is probably explained by the cost-push effect of rising intermediate import costs in the OECD resulting from rising LDC export prices. McKibbin and Sachs do not provide an explanation.

Table 10

GLOBAL MACROECONOMICS: COMPARISON OF GLOBAL MODEL RESULTS SENSITIVITY OF KEY AGGREGATES TO UNITED STATES FISCAL EXPANSION, OECD MONETARY EXPANSION, BOND-FINANCED AND BUDGET-CUT FINANCED AID TRANSFERS TO LDCs

(Indicated effects as deviation from baseline case of respective models)

	Year-1				*Year-5*			
	Y_{oecd}	*r*	*tot*	Y_{ldc}	Y_{oecd}	*r*	*tot*	Y_{ldc}
Effects of United States fiscal expansion								
MSG2	+	+ +	-	(+/-)[a]	0	+ +	-	(-)[a]
MULTIMOD	+	+	+	+	-	+	-	-
STAC	-	+	-	-	--	+	--	--
Effects of increase in aid to LDCs								
I. Bond-financed								
MULTIMOD	+	+	+	0	-	+/-	-	0
STAC	-	+	+	-	--	+	-	--
II. Monetary expansion OECD								
MSG2	+	-	+	(+)[a]	0	0	-	(-)[a]
MULTIMOD	+	-	+	+	-	+	0	-
III. Budget cuts								
STAC	+	0	+	+	+	0	-	+

Source: MSG2: McKibbin and Sachs (1991); MULTIMOD: Masson *et al.* (1988), Masson, Symanski and Meredith (1990) and Masson and Helliwell (1990); STAC: Vos (1991, 1992).

Note: Y_{oecd} = OECD growth rate; Y_{ldc} = LDC growth rate; r = international interest rates; tot = terms of trade of developing countries.

++ = strong positive effect
+ = positive effect
-- = strong negative effect
- = negative effect
0 = neutral (or near zero) effect
+/- = ambiguous effect, positive and negative, in major economies within the group (OECD or LDC)

[a] Expected outcome. Effect not reported by source.

bond-financed fiscal expansion in the North, as explained above. Global macroeconomic repercussions of higher real interest rates would tend to offset the direct positive income effects for the recipient countries of an increase in aid transfers.

(II) Monetary expansion

The option of financing additional concessional flows to developing countries by relaxing monetary targets in the industrialized creditor countries might look appealing from the perspective of developing countries. Likely, real interest rates would drop, thus stimulating aggregate demand expansion in the North and exports from the South and reducing the debt service burden of developing countries. An offsetting effect could be a terms-of-trade deterioration as a consequence of an acceleration of Northern inflation. As indicated in table 10, simulations with MSG2 and MULTIMOD[45] confirm these expected global adjustment effects for year-1. In the medium run, however, these effects tend to reverse and the positive impact on the developing country disappears. In the medium run inflation hampers an acceleration of Northern growth in these models. In particular, besides affecting international competitiveness, the decline in real interest rates affects private savings while investment demand goes up. Upward pressure on the long-term real interest rate eventually leads to a stagnation of growth in the North.

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[45] The present version of the STAC model does not specify a monetary base.

(III) Budget cuts

Simulations with the STAC model suggest that the most advantageous option for developing countries would be to finance the aid increase out of a reduction of other budget items. This would avoid upward pressures on real interest rates and consequent global demand deflation. No comparable simulations with MSG2 and MULTIMOD were available, but from the previous analysis one might expect these models to yield a similar outcome. One of the obvious candidates for achieving additional fiscal adjustment would be defence expenditures. The simulation experiments with global models (see also the simulations with the FUGI model above) suggest that cashing the 'peace dividend' for the developing countries will benefit both North and South.[46]

The simulation results of the models reviewed here are thus broadly the same. Recent experiments with the LINK global model system on the global repercussions of enhanced capital transfers to Eastern Europe and the CIS have yielded largely similar types of results (Pauly 1992). Increased capital transfers for Eastern Europe under conditions of restrictive monetary policies (that is maintaining baseline monetary targets) would raise nominal interest rates, but substantial trade stimulus from there would lead to a small GNP gain in the OECD as a whole in the short run. In the medium run, aggregate demand deflation because of higher interest rates would offset the trade stimulus (particularly due to recessionary tendencies in the United States which is expected to benefit less from trade expansion with Eastern Europe). Developing countries are expected to gain slightly from the trade expansion. But the gains are distributed unevenly: the Asian NICs take most of the gain, while the indebted countries in Latin America and Africa are the losers over the medium term as a consequence of a higher debt service burden. The LINK simulations suggest benign outcomes may be expected from a relaxation of monetary targets in the OECD countries. Capital transfers to Eastern Europe accompanied by monetary policies that would (successfully) target stable interest rates would have a stimulating impact on world economic growth, including LDC growth.

Compared to the simulations with the WAM-model, the LINK projections are optimistic about trade stimulus following capital transfers to the East. The WAM-model was based on historical patterns which are likely to be too pessimistic. However, until "the dust has settled" in Eastern Europe, it is difficult to estimate how optimistic one may be about trade expansion from these countries in the 1990s. Simulations with monetary expansion do not immediately compare to the corresponding simulations with MSG2 and MULTIMOD, as the latter do not specify a specific target with regard to interest rates. Nevertheless, the resulting acceleration of OECD inflation would in these models likely produce a less optimistic world economic outlook (similar to that reported in table 10) than that projected by LINK.

An advantage of the LINK system is that it provides more country detail than any of the other models discussed. At the same time, however, the system links about 80 rather heterogeneous country models, which makes the model's workings difficult to track. As indicated, economic interdependence between the countries is modelled through trade. Financial linkages are not explicitly modelled. National monetary and fiscal policies spill over to other countries through the effects on import demand and commodity prices. Changes in external financial asset positions like in MSG2, MULTIMOD and STAC play no role. Despite the similarities in the results of these latter three model systems, there are important differences. One important feature is stressed which has to do with potential international financial instability that might be an undesired consequence of world-wide shifts in capital transfers.

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[46] The option of a tax-financed aid increase in not discussed here. Only experiments with the STAC model are available. These suggest Northern demand deflation following a tax increase is significantly less than that resulting from a higher world interest rate. As a consequence, the South gains from an increased aid transfer, albeit suffering some terms of trade losses. See Vos (1991, 1992b) for a further discussion.

The responsiveness of global savings and investment plays a crucial role in the equilibrium adjustment of the models discussed here. Two related points of debate should be mentioned. First, the models show significant differences in empirical estimates of the elasticities of the savings and investment response to interest rate changes. Secondly, existing empirical global models underscore the potential danger of global financial instability owing to interest instability and shifts in net asset position between major economic regions.

3. *Interest rate instability?*

With regard to the responsiveness of macroeconomic balances to interest rate changes, the first versions of MULTIMOD show for the industrialized countries a very high responsiveness of savings and investment to the rate of interest. Particularly, the responsiveness of private savings is very high (e.g. for the United States the positive elasticity is about 6.0). Private investment also strongly responds to interest rate changes (between -3.0 and -4.0). This implies that an *ex-ante* savings-investment gap in the major economies only requires a relatively small change in the rate of interest. MULTIMOD MARK-II simulates that a bond-financed United States fiscal expansion of 1 per cent of GNP (equivalent to an annual exogenous injection for the global economy of about US$50 to 60 billion) would require a real interest rate increase of 0.3 percentage points to restore global macroeconomic equilibrium (see annex table A1.4). High interest-rate elasticities assumed in other empirical models for industrialized countries yield a similar result.[47] MSG2, LINK and STAC, in contrast, suggest much lower elasticities. MSG2 shows an elasticity for private savings of around 1.0 and of private investment of around -0.8. These elasticities suggest much flatter supply and demand curves for global savings and an imbalance requires much larger interest rate adjustment. In MSG2, the same United States fiscal expansion yields a real interest rate increase of 1.3 percentage points (annex table A1.4).[48] A similar 'global injection' yields in LINK a nominal interest rate increase of about 100 basis points (and about 50 in real terms) (Pauly 1992). The most recent version of MULTIMOD (IMF 1991d) includes substantial adjustment of the coefficients determining the elasticities of savings and investment to real interest rate changes. These are now much closer to the values used in MSG2 (around 1.0 and -1.0 respectively), suggesting significant interest rate increases may result from increases in concessional capital transfers to East and South if financed in the industrialized countries out of their government budgets without compensatory macroeconomic policy adjustment.

In sum, there appears to remain some scope for debate on the empirical values of critical parameters of global models. Differences in trade multiplier estimates were also discussed above. These matters may be resolved through further empirical work, but for the time being more or less optimistic outcomes with regard to interest rate instability, trade adjustment, etc. will be critical to policy guidance. How important this can be is shown by the early projections of the world economic outlook in the immediate aftermath of the debt crisis. Optimistic forecasts of the IMF (e.g. IMF 1984) and Cline (1983, 1984) strongly influenced the perception among international policy-makers that the crisis was temporary and purely a problem of liquidity. The international debt management strategy was designed in the first crucial years in this vein.[49] The author's own perception is that with regard to the interest-rate elasticity, a pessimistic inclination seems justified, i.e. the savings responsiveness to interest rates is rather small and that, all other things being equal, large capital transfer injections on the scale referred to in this paper are likely to provoke large interest rate adjustments and instability. This point of view is strengthened, of course, with the recent modification of the relevant parameters of IMF's MULTIMOD.

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[47] In table 12 the column 'other' refers to mean estimates for seven other multi-country empirical macroeconomic models. These focus on linkages between industrialized countries only. The models included are DRI, EEC, INTERMOD, MCM, MINIMOD, OECD and TAYLOR. See Bryant, *et al.* (1988) for a further discussion.

[48] In the STAC model, the Northern savings rate is little sensitive to the interest rate, though it will rise with the share of net interest income on assets and liabilities in total private income. The investment response has an elasticity of -1. However, since STAC assumes a more instantaneous adjustment of Northern GNP and investment demand to interest rate changes, the *ex-post* interest rate change is smaller than in MSG2, but analysis of the iteration steps suggest the real interest rate initially tends to move upward by about 1 percentage point following a bond-financed injection of 0.5 per cent of Northern GNP. Northern investment demand and GNP fall within the first simulation period, establishing an equilibrium interest rate which is about 0.4 percentage points above the baseline.

[49] See among others Sachs (1988), Dornbusch (1989) and Vos (1991) for critical reference to this 'model-driven' policy optimism.

4. *Global financial instability?*

If large interest rate movements are required to adjust the global macroeconomic balance, capital movements provoking such adjustment may also be a cause of greater financial instability. In terms of the present discussion, the additional demands for concessional finance may enhance the adjustment problem in the North. If not accompanied by adequate fiscal adjustment, the transfers will produce widening fiscal gaps and a further accumulation of public debt. Since private savings do not tend to compensate (fully) for this (see section I), it may become increasingly difficult to reach global macroeconomic equilibrium. Higher interest rates will have a growing impact on fiscal balances, and private sector willingness to hold public liabilities and to invest may be gradually undermined. A Northern financial crisis scenario is not contemplated by the global model systems, but the evidence seems to indicate the world economy may not be far from the edge of one.

Large interest rate adjustments and instability naturally also have a large direct impact on the indebted developing countries. If at the same time, they impact negatively on investment and growth in the North, export markets of the Southern economies will be affected and their ability to service debts and their creditworthiness will be reduced. This could imply for many developing countries a persistence of their debt problems.

In sum, global macroeconomic models suggest that a policy-driven reallocation of global savings towards the developing countries may have undesirable general equilibrium effects for the world economy as a whole. Developing countries may be doubly hit by higher interest rates and falling terms of trade and export earnings. An aid increase accompanied by more expansionary monetary policies does not seem particularly helpful as inflationary pressures yield global recessionary tendencies in the medium run. The key to a more stable global adjustment process seems to lie in adequate fiscal adjustment in the North. Northern Governments should thus trade off increased aid transfers against other government expenditures. Current political debates suggest this is a choice which will not easily be decided in favour of the poor countries. Rather, at the moment, existing aid budgets are already being eroded by reallocations of funds towards Eastern Europe. This is by no means an argument against increased aid transfers to the South. Rather, it is argued that the developing countries are better aided if the full (global) implications of these transfers are being considered as part of the policy choices to be made in the North.

These conclusions stand despite the significant differences in the structures and presumed empirical contents of the global models surveyed. Much more work on global model frameworks seems required. Besides the need to deal with global data discrepancies (see section I), some crucial 'elasticity problems' need to be cleared up, particularly regarding the responsiveness of savings and investment to interest rates and, still, the trade multipliers. Specification of global macroeconomic models should improve, including more developing country and Eastern European country detail. It is also necessary to reassess critically the modelling of the institutional behaviour underlying international capital movements.

V. Concluding remarks

The prospects for an expansion of financial flows to developing countries during the 1990s seem far from good. The outlook for some individual countries may be better than for others, but this has not been the main concern here. This paper has emphasized the global economic dimensions of the issue. Looked at it from this angle the following conclusions may be derived from the issues reviewed in this paper:

- Despite a recovery of savings rates in some industrialized countries, concerns about reduced availability of global savings in the medium run seem justified. Demographic factors predict falling private savings rates in the major economies where also the bulk of world savings is generated. Public savings in the large economies are being eroded by the accumulation of public liabilities. This is also undermining even further the responsiveness of the national savings to adjustments in the global interest rate. The response of private savings to interest rates was assessed to be rather low, while rising interest rates will reduce government savings where public debt is large. The implication for the world economy is that each exogenous shift in the global demand for investment resources, for instance an increase in capital transfers to the developing countries, will require a large interest rate adjustment to restore global capital market equilibrium and will crowd out investment elsewhere.

- Many estimates have been given of the capital requirements of developing countries for the 1990s. The methods used to derive these estimates are limited and look only at partial effects, i.e. the external financing needs required to reach a target growth rate given fixed national savings and capital-output ratios. Leaving these methodological limitations aside, the resulting LDC capital requirement estimates are large enough to have a major impact on the world economy. This implies that proposals to raise capital transfers to developing countries will have to take account of the global repercussion effects. The direct effect of additional capital inflows may be higher investment and growth in the recipient countries, but at the same time these could lead to rising world interest rates which will enhance debt-service burdens and reduce investment demand and growth in the industrialized countries. The latter effect will then spill over to commodity markets and reduce demand for developing country exports.

- An assessment of these effects using global trade and macroeconomic models confirms the importance of these repercussions. If additional capital transfers take the form of official development assistance, the effect is like a fiscal expansion in the industrialized countries. If this fiscal expansion is financed by increasing public debt, the consequences may be severe, even to the extent that what is gained through higher capital inflows, is (more than) offset by a loss of export earnings. The key to a more stable global adjustment process seems to lie in adequate fiscal adjustment in the North. Northern Governments should thus trade off increased aid transfers against other government expenditures.

- The workings of the global capital market do not provide developing countries with easy access. Additional transfers will have to come to a large extent from official sources. For most countries private capital markets are still (or have always been) cut off. The recent growth of foreign direct investment and portfolio investment flows has been restricted to a very small group of the larger and richer developing countries. There are no clear signs that this renewed access to private capital markets will be spread out over a wide group of developing countries in the coming years. At the same time, however, private agents throughout the developing world have accumulated large foreign asset holdings. The mobilization of these funds for domestic development will not be easy. Experience in countries where debt conversion programmes worked to repatriate this 'flight capital' indicates that monies returned only after a sustained period of successful adjustment. External finance required for the process of stabilization and adjustment will have to come from official sources. A major part of the developing world is still caught in this process and, in the light of the previous conclusions, will be dependent on budgetary decisions made by the governments in the industrialized countries.

- A number of global macroeconomic models can be used to assess the direct and indirect effects of enhanced capital transfers to developing countries and to analyse who gains and who loses in this game. Still, developing countries are generally poorly modelled and with little detail about structural differences within the group of LDCs. In the light of the previous conclusions, more elaborate global model(s) seems essential to assist international policy analysis. Much more research will have to be invested in this area to deal with the global data discrepancies (see section I), to clear some crucial 'elasticity issues' (particularly regarding the responsiveness of savings and investment to interest rates and trade multipliers), to provide more developing country and Eastern European country detail and critically to reassess the modelling of the institutional behaviour underlying international capital movements.

References

Aghevli, B. *et al.* (1990), 'The role of national savings in the world economy', IMF Occasional Paper No. 67, Washington, D.C.: IMF.

Anthony, M. and A. Hughes-Hallet (1992), 'How sucessfully do we measure capital flight?', *Journal of Development Studies*, 28(3): 538-556.

Bacha, E. (1990), 'A Three-Gap model of foreign transfers and the GDP growth rate in developing countries', *Journal of Development Economics*, 32: 279-296.

Bachmann, H. (1991), 'Industrialized Countries' Policies Affecting Foreign Direct Investment in Developing Countries', PAS Research Paper Series, MIGA, Washington, D.C.: The World Bank.

Bosworth, B., G. Burtless and J. Sabelhaus (1991), 'The decline in saving: Some microeconomic evidence', *Brookings Papers on Economic Activity*, No. 1: 183-241.

Bovenberg, L. and O. Evans (1990), 'National and personal savings in the United States', *IMF Staff Papers*, 37(3): 636-669.

Boyce, J.K. (1990), *The Political Economy of External Indebtedness. A Case Study of the Philippines*, PIDS Monograph Series No. 12, Manila: PIDS.

Brandt Commission Report (1980), *North-South: A programme for survival*, New York: Pan.

Bryant, R. *et al.* (eds.) (1988), *Empirical Macroeconomics for Interdependent Economies*, Washington, D.C.: The Brookings Institution.

Byron, R. (1978), 'The estimation of large social accounting matrices', *Journal of the Royal Statistical Society*, Series A, 141(3): 359-367.

Chenery, H.B. and M. Bruno (1962), 'Development alternatives in an open economy: The case of israel', *Economic Journal*, 72(285): 79-103 (March).

Cline, W. (1983), *International Debt and the Stability of the World Economy*, Policy Analyses in International Economics No. 4, Washington, D.C.: Institute for International Economics.

----- (1984), *International Debt. Systemic Risk and Policy Response*, Washington, D.C.: Institute for International Economics.

Collins, S. and D. Rodrik (1991), *Eastern Europe and the Soviet Union in the World Economy*, Policy Analyses in International Economics No. 32, Washington,D.C.: Institute for International Economics.

Corden, W. and M. Dooley (1989), 'Issues in debt strategy: an overview', in J. Frenkel, M. Dooley and P. Wickham (eds) (1989) *Analytical Issues in Debt*, Washington, D.C.: IMF, pp. 10-37.

Cuddington, J.T. (1986), *Capital Flight: Estimates, Issues and Explanations*, Princeton Studies in International Finance No. 58, Princeton: Princeton University Press.

Currie, D. and D. Vines (eds.) (1988), *Macroeconomic Interactions between North and South*, Cambridge: Cambridge University Press.

Darity, W. and B. Horn (1988), *The Loan Pushers. The Role of Commercial Banks in the International Debt Crisis*, Cambridge, MA: Ballinger.

Development Committee (1988), *The adequacy of resource flows to developing countries*, Washington, D.C.

Devlin, R. (1989), *Debt and Crisis in Latin America: The Supply-side of the Story*, Princeton: Princeton University Press.

Dornbusch, R. (1989), 'Debt problems and the world economy', in J.D. Sachs (ed.) *Developing Country Debt and Economic Performance*, Chicago: The University of Chicago Press (for NBER), pp. 331-57.

Dunning, J. (1981), 'Explaining the international direct investment position of countries. Towards a dynamic or developmental approach', *Weltwirtschaftliches Archiv*, 117: 30-64.

Eaton, J. (1987), 'Public debt guarantees and private capital flight', *World Bank Economic Review*, 1(3): 377-395.

----- (1989), 'Foreign public capital flows', in H.B. Chenery and T.N. Srinivasan (eds) *Handbook of Development Economics. Volume II*, Amsterdam: North-Holland, pp. 1305-86.

Eaton, J., M. Gersovitz and J. Stiglitz (1986), 'The pure theory of country risk', *European Economic Review*, 30: 481-513.

Economic Commission for Europe (1990), *Economic Survey of Europe in 1989-90*, Geneva: United Nations.

European Economy (1990), 'Savings, investment and real interest rates', No. 46 (December), pp. 199-216.

Filator,, V. B. Hickman and L. Klein (1983), 'Long-term simulations with the project LINK system 1978-85;, in B. Hickman (ed.) (1983) *Global International Economic Models*, Amsterdam: North-Holland, pp. 29-52.

Findlay, R. (1984), "Growth and development in trade models", in R.W. Jones and P. Kenen (eds) *Handbook of International Economics*, Volume I, Amsterdam: North-Holland, pp. 185-236.

Fishlow, A. (1987), 'Capital requirements in developing countries in the next decade', *Journal of Development Planning*, XVII: 245-91.

Goodwin, R. (1979), 'World trade multipliers', *Journal of Post-Keynesian Economics*, 11(3): 319-344.

Gregory, M. (1992), 'Japan in the International Economy. Some Perspectives on Japan's Overseas Development Aid', St. Hilda's College, Oxford University (mimeo).

Griffin, K. (1970), 'Foreign capital, domestic savings and economic development', *Bulletin of the Oxford Institute of Economics and Statistics*, 32: 99-112.

----- (1986), 'Doubts about aid', *IDS Bulletin*, 17(2): 36-45.

Gupta, K. (1984), *Finance and Economic Growth in Developing Countries*, London: Croom Helm.

Hermes, N. and R. Lensink (1990), 'Capital flight from six sub-Saharan African countries', Research Memorandum No. 381, University of Groningen, Groningen.

Hickman, B. (1987), 'Project LINK and Multicountry modelling', Stanford University, Stanford (mimeo).

Hicks, N. *et al.* (1976), 'A model of trade and growth for the developing world. The SIMLINK model', *European Economic Review*, 7(3): 239-55.

IMF (1987), *Report on the World Current Account Discrepancy*, Washington, D.C.: IMF.

----- (1991a), *World Economic Outlook*, May 1991, Washington, D.C.: IMF.

----- (1991b), *World Economic Outlook*, October 1991, Washington, D.C.: IMF.

----- (1991c), *Private Market Financing for Developing Countries*, Washington, D.C.: IMF.

----- (1991d), 'Changes to MULTIMOD since the July 1990 Occasional Paper No. 71', IMF, Washington, D.C. (mimeo, July).

----- (1992), 'Final report of the Working Party on the Measurement of International Capital Flows', IMF, Washington, D.C. (mimeo).

Izurieta, A. and R. Vos (1992), 'Multipliers in International Trade. A World Accounting Approach', Institute of Social Studies (in preparation).

Jayawardena, L. (1983), 'International Keynesianism - A solution to the world crisis?', in K. Jansen (ed.) (1983) *Monetarism and The Third World*, London: Frank Cass, pp. 149-174.

Jong, N. de, R. Vos and T. Jellema (1991), 'Financial flows in a world accounting framework', paper prepared for UN-DIESA and Project LINK, Institute of Social Studies and Growth Dynamics University Institute, The Hague and Rotterdam (mimeo).

Lagos, R.A. (1992), 'Debt relief through debt conversion: A critical analysis of the Chilean debt conversion', *Journal of Development Studies*, 28(3): 473-499.

Leontief, W. *et al.* (1977), *The Future of the World Economy*, New York: Oxford University Press.

Luttik, J. (1992, forthcoming), *The World Accounting Matrix*, Ph.D dissertation, University of Amsterdam, Institute of Social Studies, Amsterdam and The Hague.

Masson, P. (1990), 'Long-term macroeconomic effects of aging populations', *Finance and Development*, June: 6-9.

Masson, P., *et al.* (1988), 'MULTIMOD - A Multi-region econometric model', in IMF (1988) *Staff Studies for the World Economic Outlook*, Washington, D.C.: IMF, pp. 50-104.

Masson, P. and J. Helliwell (1990), 'The effects of industrial country fiscal policies on developing countries in the 1980s', Paper presented at the Brookings Institution/PUC-Rio/CEPR Workshop on North-South Macroeconomic Interactions, Rio de Janeiro, October.

Masson, P. and G. Meredith (1991), 'Domestic and international consequences of German Unification', in L. Lipschitz and D. McDonald (eds.) (1990) *German Unification. Economic Issues*, IMF Occassional Paper No. 75, Washington, D.C.: IMF, pp. 93-114.

Masson, P., S. Symanski and G. Meredith (1990), *MULTIMOD Mark II: A revised and extended model*, IMF Occassional Paper No. 71, Washington, D.C.: IMF.

McKibbin, W. and J. Sachs (1991), *Macroeconomic Interdependence and Cooperation in the World Economy*, Washington, D.C.: The Brookings Institution.

Meade, J. (1951), *The Theory of International Economic Policy. Volume I: The Balance of Payments*, London: Oxford University Press.

Metzler, L.A. (1950), 'A Multiple-Region Theory of Income and Trade', *Econometrica*, 18(4): 329-354.

Mosley, P., J. Harrigan and J. Toye (1991), *Aid and Power*, London: Routledge.

Ocampo, J.A. (1986), 'New developments in trade theory and LDCs', *Journal of Development Economics*, 22: 129-170.

OECD (1982), 'The OECD INTERLINK system', Economics and Statistics Department, OECD, Paris (mimeo).

Onishi, A. (1981), 'Projections of alternative paths of development of the ESCAP countries in the Third United Nations Development Decade', *Soka Economic Studies Quarterly*, March: 175-227.

Papadia, F. *et al.* (1991), 'The effects of Eastern European countries' economic reform on western industrial economies: A macroeconomic approach', Discussion Paper Banca d'Italia, Rome.

Pauly, P. (1992), 'Transfers, real interest rates and regional development: International implications of financial support for the economies in transition', studies for the Group of Twenty-Four.

Pyatt, G. and J. Round (1979), 'Accounting and fixed-price multipliers in a Social Accounting Matrix' *Economic Journal*, 89: 850-73.

Richardson, P. (1987), 'A review of the simulation properties of OECD's INTERLINK model', OECD Department of Statistics Working Paper No. 47, Paris: OECD.

Rosenstein-Rodan, P. (1961), 'International aid for underdeveloped countries', *Review of Economics and Statistics*, 43: 107-38.

Sachs, J. (1988), 'International policy coordination: The case of the developing country debt problem', in M. Feldstein (ed.) (1988) *International Economic Cooperation*, Chicago: The University of Chicago Press (for NBER).

Schmidt-Hebbel, K. and S. Webb (1992), 'Public policy and private saving', in V. Corbo, S. Fischer and S. Webb (eds) (1992) *Adjustment Lending Revisited.* A World Bank Symposium, Washington, D.C.: The World Bank, pp. 139-158.

Stiglitz, J. and A. Weiss (1981), 'Credit rationing in markets with imperfect information', *American Economic Review*, 71(2): 393-410.

Stone, R. (1977), 'Foreword', in G. Pyatt and A. Roe, *et al.* (1977) *Social Accounting for Development Planning with Special Reference to Sri Lanka*, Cambridge: Cambridge University Press.

Taylor, L. (1981), "North-South trade and Southern growth: Bleak prospects from the structuralist point of view", *Journal of International Economics*, 11: 589-602.

----- (1990), 'Foreign resource flows and developing country growth: A three-gap model', in F.D. McCarthy (ed.) (1990) *Problems of Developing Countries in the 1990s*, World Bank Discussion Papers 97, Washington, D.C.: World Bank, pp. 49-90.

Thorbecke, E. and A. Fields (1974), 'A Ten-Region Model of World Trade', in W. Sellekaerts (ed.) (1974) *International Trade and Finance. Essays in Honour of Jan Tinbergen*, London: Macmillan.

Tims, W. and J. Waelbroeck (1982), *Global Modelling in the World Bank*, World Bank Staff Working Paper No. 544, Washington, D.C.: The World Bank.

Vines, D. and A. Muscatelli (1989), 'Macroeconomic interactions between North and South', in R. Bryant, D. Currie *et al.* (eds) (1989) *Macroeconomic Policies in an Interdependent World*, Washington, D.C.: IMF (with The Brookings Institution and CEPR).

Vos, R. (1989), 'Accounting for the world economy', *Review of Income and Wealth*, 35(4): 389-408.

----- (1991), *The World Economy, Debt and Adjustment. Structural Asymmetries in North-South Interactions*, Amsterdam, The Hague: Free University, ISS (forthcoming London, Macmillan, 1993).

----- (1992a), 'Private foreign asset accumulation, not just capital flight: Evidence from the Philippines', *Journal of Development Studies*, 28(3): 500-537.

----- (1992b), 'Aid flows, trade and global macroeconomic adjustment', paper presented at Annual Conference of the Royal Economic Society, London, April (also issued as ISS Working Paper Series on Money, Finance and Development, No. 41, The Hague: ISS).

Weale, M. (1984), 'Quantity and price effects in an analysis of world trade based on an accounting matrix', *Review of Income and Wealth*, 30(1): 85-117.

World Bank (1991), 'African Financing Needs in the 1990s', PRE Working Papers WPS 764, Washington, D.C.: The World Bank.

----- (1992), *World Development Report 1992*, New York, Oxford: Oxford University Press.

----- (1992), *Global Economic Prospects and the Developing Countries*, 1992, Washington, D.C.: The World Bank.

Annex

Table A1.1a
Global Savings and Investment Rates, 1970-90
(percent of GNP)

GNS/GNP (%)	1970-73	1974-77	1978-82	1983-85	1986-90
DEVELOPED	22.93	21.81	21.73	19.70	20.73
G-7	22.58	21.71	21.84	19.47	20.52
USA	18.36	18.01	18.74	15.37	14.12
Japan	36.52	32.47	30.92	30.38	32.58
Germany, F.R.	26.02	21.99	21.35	21.81	24.14
REST OECD	25.17	22.21	20.78	20.92	21.94
OTHER HICs	22.80	23.26	26.10	24.32	22.26
EE6+SU	20.15	19.75	19.07	20.26	17.04
MAJOR OIL EXP.	26.04	47.02	37.42	20.69	18.88
LDCs	17.66	19.68	20.24	19.87	22.44
EMENA	21.85	22.86	24.79	23.76	27.24
SSA	13.44	17.76	13.32	9.81	11.38
LAC	17.60	19.67	18.61	17.10	19.01
SOUTH ASIA	13.22	15.39	17.02	17.18	16.54
CHINA	20.46	20.94	24.12	26.37	26.98
EAST ASIA	19.03	21.15	24.15	24.57	29.27
OFF SHORE BK CTR	21.69	26.53	28.33	30.49	31.23
OTHER, N.E.C.	17.16	13.88	13.32	15.08	12.21
WORLD	21.77	21.86	21.70	19.91	20.60

GDI/GNP (%)	1970-73	1974-77	1978-82	1983-85	1986-90
DEVELOPED	22.64	22.17	22.04	20.21	21.17
G-7	22.21	21.72	21.88	20.01	20.94
USA	18.32	17.81	18.86	17.67	16.87
Japan	35.11	32.20	30.74	27.66	29.81
Germany, F.R.	25.30	20.63	21.51	20.10	20.06
REST OECD	25.08	24.16	22.60	21.25	22.69
OTHER HICs	27.04	28.12	26.61	24.30	19.59
EE6+SU	20.08	20.42	19.05	19.40	16.98
MAJOR OIL EXP.	17.80	22.14	25.02	22.65	17.99
LDCs	18.95	21.84	23.49	21.12	23.04
EMENA	22.22	27.50	29.06	26.20	27.99
SSA	15.70	19.26	18.43	12.21	15.26
LAC	19.64	22.53	23.10	17.70	20.15
SOUTH ASIA	14.34	15.91	18.79	19.26	19.28
CHINA	20.45	21.01	23.40	26.93	28.25
EAST ASIA	20.67	23.68	27.25	25.71	25.91
OFF SHORE BK CTRS	26.73	27.32	32.90	29.07	26.41
OTHER, N.E.C.	19.66	16.38	16.67	14.61	13.75
WORLD	21.68	21.97	22.11	20.43	20.99

(Table A1.1a, continued...)

(S-I)/GNP (%)	1970-73	1974-77	1978-82	1983-85	1986-90
DEVELOPED	0.28	-0.37	-0.32	-0.51	-0.44
G-7	0.36	0.00	-0.04	-0.53	-0.42
USA	0.04	0.19	-0.12	-2.30	-2.75
Japan	1.41	0.27	0.17	2.72	2.77
Germany, F.R.	0.72	1.36	-0.16	1.70	4.08
REST OECD	0.09	-1.95	-1.82	-0.33	-0.75
OTHER HICs	-4.23	-4.86	-0.51	0.02	2.67
EE6+SU	0.08	-0.67	0.02	0.86	0.06
MAJOR OIL EXP.	8.24	24.88	12.40	-1.95	0.89
LDCs	-1.29	-2.16	-3.25	-1.25	-0.60
EMENA	-0.37	-4.65	-4.27	-2.44	-0.75
SSA	-2.26	-1.50	-5.11	-2.39	-3.89
LAC	-2.04	-2.86	-4.50	-0.60	-1.14
SOUTH ASIA	-1.12	-0.53	-1.77	-2.08	-2.74
CHINA	0.01	-0.06	0.71	-0.56	-1.27
EAST ASIA	-1.65	-2.54	-3.10	-1.14	3.35
OFF SHORE BK CTRS	-5.04	-0.79	-4.57	1.41	4.82
OTHER, N.E.C.	-2.50	-2.50	-3.35	0.47	-1.54
WORLD	0.09	-0.11	-0.41	-0.53	-0.39

Source: World Bank data. Ratios derived from current US dollar values.

Notes: GNS (S) = Gross National Savings (= Current Account Balance plus GDI)
GDI (I) = Gross Domestic Investment.
S-I = GNS - GDI = CAB.

Other HICs = Other High-Income Countries (includes Israel, South Africa).
Major Oil Exp.= Major oil exporters of Middle East and North Africa.
EE6 & SU = Eastern Europe (Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, Romania) and former Soviet Union.
EMENA = LDCs in Europe, Middle East (excl. MOE) and North Africa.
SSA = Sub-Sahara Africa.
LAC = Latin America and Caribbean.
Off-shore bk. = Off-shore banking centres (includes Hong Kong, Bahamas, Bahrain, Bermuda, Cayman Islands, Lebanon, Liberia, Netherlands Antilles, Panama, Singapore, Vanuatu, West Indies).

Table A1.1b
Private Savings and Investment Rates, 1970-90.
(percent of GNP)

GNSp/GNP	**1970-73**	**1974-77**	**1978-82**	**1983-85**	**1986-90**
DEVELOPED	19.39	20.29	20.95	20.39	19.62
G-7	19.32	20.56	21.04	20.14	19.38
USA	16.72	17.92	18.20	17.20	14.95
Japan	26.45	25.99	25.79	24.97	24.58
Germany, F.R.	21.57	21.49	21.06	21.24	23.52
REST OECD	19.74	19.05	20.63	21.95	21.05
OTHER HIC	20.19	17.89	19.65	22.06	20.74
EE6+SU	3.48	2.89	3.57	3.93	7.70
MAJOR OIL EXP.	12.85	18.20	10.65	6.65	7.41
LDCs	10.28	11.56	11.20	12.77	17.55
EMENA	11.35	11.46	12.86	13.57	17.64
SSA	8.44	13.17	4.10	7.44	11.24
LAC	13.78	13.80	12.73	16.49	23.07
SOUTH ASIA	10.37	12.98	14.34	14.82	16.21
CHINA	2.08	0.82	2.35	-0.18	-0.64
EAST ASIA	15.47	15.37	17.49	18.02	24.44
OFF SHORE BK CTRS	17.71	19.87	20.14	22.62	24.54
OTHER, N.E.C.	11.79	10.06	8.93	12.95	10.19
WORLD	15.51	16.54	17.12	17.06	18.01

GDIp/GNP	**1970-73**	**1974-77**	**1978-82**	**1983-85**	**1986-90**
DEVELOPED	18.78	18.35	18.45	17.17	18.05
G-7	18.54	18.06	18.38	17.08	17.87
USA	16.06	15.86	17.25	16.20	15.32
Japan	26.04	23.21	21.22	20.08	23.14
Germany, F.R.	21.03	16.95	18.22	17.70	18.05
REST OECD	20.64	20.08	19.05	17.93	19.51
OTHER HIC	15.30	15.78	15.58	15.33	13.13
EE6+SU	1.07	1.24	1.10	1.13	0.79
MAJOR OIL EXP.	5.19	6.73	9.50	8.13	5.26
LDCs	8.87	10.55	10.96	9.59	12.22
EMENA	10.30	12.71	13.89	13.00	16.58
SSA	7.34	9.52	8.57	5.54	7.39
LAC	12.82	13.44	12.95	10.54	13.63
SOUTH ASIA	8.15	8.62	9.49	9.16	9.58
CHINA	0.00	0.00	0.00	0.00	0.00
EAST ASIA	14.45	15.87	17.67	16.81	19.37
OFF SHORE BK CTRS	21.99	20.51	25.42	20.96	21.40
OTHER, N.E.C.	11.79	11.62	10.95	10.38	10.06
WORLD	14.45	14.68	14.69	14.66	14.59

(Table A1.1b, continued ....)

$(S_p-I_p)/GNP$	1970-73	1974-77	1978-82	1983-85	1986-90
DEVELOPED	0.61	1.94	2.50	3.21	1.57
G-7 (1-7)	0.78	2.50	2.65	3.05	1.51
USA	0.66	2.06	0.95	1.00	-0.37
Japan	0.41	2.77	4.57	4.88	1.44
Germany, F.R.	0.54	4.54	2.85	3.53	5.47
REST OECD	-0.90	-1.03	1.57	4.02	1.55
OTHER HICs	4.88	2.11	4.07	6.73	7.61
EE6+SU	2.41	1.64	2.47	2.80	6.92
MAJOR OIL EXP.	7.66	11.47	1.15	-1.48	2.15
LDCs	1.42	1.01	0.23	3.18	5.33
EMENA	1.05	-1.25	-1.03	0.57	1.06
SSA	1.10	3.64	-4.48	1.90	3.85
LAC	0.96	0.37	-0.22	5.95	9.45
SOUTH ASIA	2.23	4.37	4.85	5.65	6.63
CHINA	2.08	0.82	2.35	-0.18	-0.64
EAST ASIA	1.02	-0.51	-0.19	1.22	5.07
OFF SHORE BK CTRS.	-4.28	-0.65	-5.28	1.66	3.14
OTHER, N.E.C.	0.00	0.00	-0.84	3.01	0.96
WORLD	1.06	1.95	2.04	2.99	2.56

Source and Notes: See Table A1.1a.

Table A1.1c
Public Savings and Investment Rates, 1970-90.
(percent of GNP)

GNS_g/GNP	1970-73	1974-77	1978-82	1983-85	1986-90
DEVELOPED	3.54	1.52	0.77	-0.68	1.11
G-7 (1-7)	3.26	1.15	0.81	-0.67	1.14
USA	1.63	0.08	0.54	-1.83	-0.83
Japan	10.08	6.48	5.12	5.41	7.99
Germany, F.R.	4.45	0.50	0.28	0.57	0.61
REST OECD	5.43	3.16	0.15	-1.03	0.89
OTHER HICs	2.62	5.37	6.45	2.25	1.51
EE6+SU	16.68	16.86	15.50	16.33	9.33
MAJOR OIL EXP.	13.19	28.82	26.77	14.05	11.47
LDCs	7.37	8.11	9.05	7.10	4.88
EMENA	10.50	11.40	11.94	10.20	9.59
SSA	5.00	4.59	9.23	2.37	0.14
LAC	3.82	5.86	5.88	0.61	-4.06
SOUTH ASIA	2.85	2.40	2.68	2.37	0.33
CHINA	18.38	20.12	21.77	26.55	27.62
EAST ASIA	3.56	5.78	6.66	6.54	4.82
OFF SHORE BK CTRS.	3.98	6.66	8.19	7.86	6.69
OTHER, N.E.C.	5.37	3.81	4.39	2.13	2.03
WORLD	6.26	5.27	4.57	2.81	2.65

GDI_g/GNP	1970-73	1974-77	1978-82	1983-85	1986-90
DEVELOPED	3.86	3.95	3.99	3.93	3.82
G-7 (1-7)	3.68	3.78	3.84	3.78	3.66
USA	2.26	1.95	1.61	1.46	1.55
Japan	9.08	8.98	9.52	7.57	6.66
Germany, F.R.	4.27	3.68	3.29	2.40	2.01
REST OECD	4.44	4.36	4.27	4.13	4.09
OTHER HICs	11.73	11.85	12.17	12.24	12.34
EE6+SU	19.01	19.10	18.99	19.13	19.17
MAJOR OIL EXP.	12.61	12.12	12.96	14.24	15.41
LDCs	10.08	10.08	10.45	10.86	11.29
EMENA	11.92	11.80	12.17	13.40	14.80
SSA	8.37	8.67	9.25	9.57	9.74
LAC	6.82	7.06	7.71	8.34	9.09
SOUTH ASIA	6.19	6.18	6.37	6.78	7.30
CHINA	20.45	20.53	20.77	21.01	21.01
EAST ASIA	6.22	6.20	6.66	7.20	7.81
OFF SHORE BK CTRS.	4.74	5.20	5.86	6.23	6.81
OTHER, N.E.C.	7.87	7.70	7.13	6.62	6.31
WORLD	7.23	7.23	7.29	7.34	7.33

(Table A1.1c, continued ....)

$(S_t - I_t)/GNP$	1970-73	1974-77	1978-82	1983-85	1986-90
DEVELOPED	-0.32	-2.30	-2.82	-3.72	-2.01
G-7	-0.42	-2.50	-2.69	-3.59	-1.93
USA	-0.63	-1.87	-1.06	-3.30	-2.38
Japan	1.00	-2.50	-4.40	-2.16	1.33
Germany, F.R.	0.18	-3.18	-3.00	-1.83	-1.40
REST OECD	0.99	-0.92	-3.40	-4.35	-2.30
OTHER HICs	-9.12	-6.97	-4.58	-6.72	-4.94
EE6+SU	-2.33	-2.31	-2.45	-1.94	-6.86
MAJOR OIL EXP.	0.58	13.41	11.25	-0.47	-1.27
LDCs	-2.71	-3.18	-3.48	-4.43	-5.93
EMENA	-1.42	-3.40	-3.24	-3.00	-1.81
SSA	-3.36	-5.15	-0.63	-4.29	-7.73
LAC	-3.00	-3.23	-4.28	-6.55	-10.58
SOUTH ASIA	-3.34	-4.89	-6.62	-7.73	-9.37
CHINA	-2.07	-0.89	-1.64	-0.39	-0.62
EAST ASIA	-2.66	-2.03	-2.92	-2.35	-1.72
OFF SHORE	-0.76	-0.15	0.71	-0.25	1.68
OTHER, N.E.C.	-2.50	-2.50	-2.51	-2.54	-2.50
WORLD	-0.97	-2.06	-2.45	-3.52	-2.93

Source and Notes: See Table A1.1a.

Table A1.2
Alternative estimates of additional financial resource requirements in the 1990s.

	annual requirements (bln US$, 1990)	GDP growth target (%)	Projection period
Capital requirements LDCs			
All LDCs			
Fishlow (1987)	180	5.3	1995
Development Committee (1988)			
WIDER (Taylor 1990)	43	1.0	
Sub-Sahara Africa			
Fishlow (1987)	15	3.9	1995
Development Committee (1988)	12	3.4	1992
WIDER (Taylor 1990)	28	4.0	
World Bank (1991)	28	5.0	1991-2000
Asia			
Fishlow (1987)	23	6.2	1995
Development Committee (1988)	19	5.4	1992
WIDER (Taylor 1990)	18	1.0	
Europe, Middle East and North Africa			
Fishlow (1987)			
Development Committee (1988)			
WIDER (Taylor 1990)	8	1.0	
Latin America and Caribbean			
Fishlow (1987)	61	5.4	1995
Development Committee (1988)			
WIDER (Taylor 1990)	36	4.0	
Capital requirements Eastern Europe and CIS			
Collins and Rodrik I (1991)	915	7.0	1991-2001
Collins and Rodrik II (1991)	17		1991-2001
Papadia et al. (1991)	340		1991-2011
IMF (1991b)	90		
Eastern Europe (EE5)			
Collins and Rodrik I (1991)	344	7.0	1991-2001
Collins and Rodrik II (1991)	5		1991-2001
Papadia et al. (1991)	100		1991-2011
CIS			
Collins and Rodrik I (1991)	571	7.0	1991-2001
Collins and Rodrik II (1991)	12		1991-2001
Papadia et al. (1991)	160		1991-1996
German Unification			
Papadia et al. (1991)	80		1991-2011
IMF (1991b)	60		1991-1996

Sources: See bibliography.

Explanatory notes:

Capital requirements of LDCs:
- Fishlow (1987) estimations: Based on two-gap model for estimating capital inflow requirements at fixed national savings rates and capital-output coefficients and for pre-set growth targets as indicated in second column.
- Development Committee estimations: Similar methodology as Fishlow (1987).
- WIDER-Taylor estimates: based on three-gap model and extrapolated country group data from 18 individual country models. Base projections simulate capital requirements for 1 percent production capacity increase. data for Sub-Sahara Africa and Latin America presented in the table are a multiple of the estimates presented in Taylor (1990) on the assumption that a 'needs' scenario for these regions would require an expansion of growth capacity of about 4 percent to yield per capita income growth rates of about 1.5 percent.
- World Bank (1991): Based on current account projections with assumption for export growth, import elasticities, projected debt service burden and debt relief.

(Table A1.2, continued ...)

Capital requirements for Eastern Europe and CIS:
- Collins and Rodrik I (1991): Estimations based on real GNP growth of 7.0 percent per year. Assumptions: fixed capital-output ratio of 2.5. Collins and Rodrik assume rather unrealistically that all annual accumulation is to be financed through external capital inflows. In Table 2 of the text these estimates of Collins and Rodrik were corrected for a projected national savings availability in the EE6 and CIS based (possibly optimistically) on constant 1990 savings rates.
- Collins and Rodrik II (1991): Estimations based on Marshall Plan type aid programme for EE6 and CIS. Marshall plan aid flows were scaled to present day values using various alternatives. The one presented here follows a procedure also applied by a study of the Economic Commission for Europe, by which the real per capita transfer is kept the same as that received by the western European countries after World War II. This leads to Collins-Rodrik's lower bound estimate of capital requirements for Eastern Europe.
- Papadia et al. (1991): Estimations over 20 year adjustment period targetting that ex-GDR reaches per capita income level close to that of the western part of Germany, while the EE5 (Bulgaria, Czechoslovakia, Hungary, Poland, Romania) and the CIS reach per capita income levels at level of average of low- to middle-income countries of the European Community. Method is based on existing labour productivity, capital-output ratios, Cobb-Douglas production function characteristics, and constant national savings rates.
- IMF (1991b): Estimation for German Unification based on Masson and Meredith (1990) using similar approach as in Papadia et al., but assuming rising labour productivity to about 80 percent of its level in west Germany. Estimates for CIS not based on any particular method, but taken to be a meaningful number "for illustrative purposes".

Table A1.3

WORLD ACCOUNTING MATRIX (WAM), 1985

(Current prices, values in billions of US$)

		US 1	Japan 2	EC 3	OOECD 4	CMEA 5	MOE 6	OB 7	DB 8	PB 9	ROW 10	MULTI 11	US 12	Japan 13	EC 14	OOECD 15	CMEA 16	MOE 17	OB 18	DB 19	PB 20	ROW 21	MULTI 22	CP 23	CG 24	RESERV 25	Total
US	1	0.0	43.0	90.2	93.3	4.3	11.4	16.9	19.0	61.7	24.1	1.0	652.4											2629.7	816.0		4462.9
Japan	2	84.0	0.0	30.4	17.3	4.0	13.0	13.0	25.5	24.5	14.4	0.6		376.1										774.2	128.9		1506.1
EC	3	102.6	16.7	555.3	129.4	31.0	51.9	33.0	26.8	54.8	19.8	2.3			479.6									1531.3	483.5		3518.1
OOECD	4	118.3	18.7	87.1	25.9	11.3	6.6	9.2	7.5	13.7	6.3	1.0				207.5								523.4	178.8		1215.3
CMEA	5	2.4	2.0	35.7	12.9	119.1	3.4	14.5	5.5	3.2	2.2	0.1					195.6							480.2	74.6		951.5
MOE	6	7.4	26.8	43.2	3.0	2.1	6.4	13.1	7.5	20.1	5.1	0.0						102.4						186.7	121.5		545.2
OB	7	21.9	7.4	31.8	6.0	13.0	13.1	6.1	2.3	6.0	2.5	6.1							89.3					278.3	54.7		538.6
DB	8	13.5	23.3	15.5	3.8	4.1	7.1	6.5	2.2	9.8	9.8	2.0								177.7				346.8	60.1		682.1
PB	9	77.9	21.1	53.1	10.6	4.8	7.8	16.5	9.7	26.3	7.6	1.3									170.4			597.6	98.5		1102.7
ROW	10	35.0	8.0	17.4	6.2	6.5	2.4	3.8	7.0	4.6	4.1	3.4										50.9		104.2	27.0		280.7
MULTI	11	2.9	1.0	6.0	3.0	0.0	0.0	1.0	1.6	2.2	0.0	0.0											0.0	0.0			17.7
US	12	551.3											0.0	40.7	55.1	12.3	0.0	9.5	-2.2	2.1	12.2	0.0	-0.0				681.0
Japan	13		435.1										2.1	0.0	50.2	1.4	0.0	0.0	0.0	0.0	0.1	0.4	0.0				489.4
EC	14			537.5									7.9	41.8	96.9	27.8	1.3	-0.4	0.0	0.0	0.2	0.5	-0.0				713.5
OOECD	15				201.7								3.7	18.0	23.5	1.5	-0.0	2.4	0.0	0.6	0.1	0.4	-0.0				251.9
CMEA	16					196.6							-1.4	0.6	1.9	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0				198.1
MOE	17						113.9						-0.3	2.2	-0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				115.9
OB	18							72.0					1.9	2.6	4.6	0.2	0.6	0.5	0.0	0.0	0.0	0.0	4.5				87.0
DB	19								160.4				2.3	5.7	2.4	-0.9	-0.0	0.3	0.0	0.1	0.0	0.0	4.1				174.4
PB	20									179.8			7.9	-0.1	-2.9	-2.4	-0.2	-0.5	0.0	0.0	0.0	0.0	2.9				184.7
ROW	21										53.6		0.2	0.1	-1.4	-0.2	-0.2	0.0	0.0	0.0	0.0	0.0	0.0				52.0
MULTI	22												2.5	1.5	5.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0				11.5
Priv Cons.	23	2629.7	774.2	1531.3	523.4	480.2	186.7	278.3	346.8	597.6	104.2	0.0															7450.5
Govt Cons.	24	816.0	128.9	483.5	178.8	74.6	121.5	54.7	60.1	98.5	27.0	0.0															2043.5
Reserves	25												1.8	0.2	-1.4	1.7	1.1	1.6	-0.2	-6.1	1.6	-0.3	0.0				0.0
Total		4462.9	1506.1	3518.0	1215.3	951.5	545.2	538.6	682.1	1102.7	280.7	17.7	681.0	489.4	713.5	251.9	198.1	115.9	87.0	174.4	184.7	52.0	11.5	7450.5	2043.5	0.0	27274.3

Note:

EC = European Community
OOECD = Other OECD
CMEA = Formerly centrally planned countries of Eastern Europe and USSR
MOE = Major oil exporters (in North Afria and Middle-East)
OB = LDC-OB, 'Official borrowers'
DB = LDC-DB, 'Dviersified borrowers'
PB = LDC-PB, 'Private borrowers'
ROW = Other countries, n.o.c.
MULTI = Multilateral institutions

Other accounts:

RESERV = Change in reserves

Table A1.4

GLOBAL MACROECONOMIC MODELS: MULTIPLIERS US FISCAL POLICY

	Year 1				Year 5			
	MSG2	MULTIMOD	OTHER		MSG2	MULTIMOD	OTHER	
			Mean	S.D.			Mean	S.D.
United States								
GNP	0.56	0.80	1.40	0.31	0.06	-0.40	0.64	0.35
Private investment	-0.09	-0.11			-0.23	-0.16		
Private savings	0.40	0.29			0.38	0.12		
Budget deficit	0.79	0.60			0.94	0.30		
Current account	-0.39	-0.10	-0.24	0.10	-0.33	-0.26	-0.44	0.21
Inflation (%)	-0.11	0.30	0.15	0.14	0.15	0.80	0.64	n.a.
Real interest rate (%)	1.16	0.30	0.53	0.22	1.36	0.30	0.84	0.48
Japan								
GNP	0.18	0.10	0.39	0.15	-0.05	0.10	0.69	0.61
Private investment	-0.18	-0.05			-0.31	-0.07		
Private savings	0.22	0.05			0.00	0.13		
Budget deficit	-0.03	0.0			0.05	0.0		
Current account	0.43	0.10			0.26	0.20		
Inflation (%)	0.27	0.10	0.11	0.14	0.07	0.30	0.34	n.a.
Real interest rate (%)	1.02	0.20	0.15	0.28	1.31	0.10	0.20	0.22
Germany								
GNP	0.21	0.10	0.22	0.11	-0.14	0.20	0.36	0.29
Private investment	-0.16	-0.05			-0.31	-0.07		
Private savings	0.15	0.05			0.05	0.23		
Budget deficit	-0.05	0.0			0.07	0.0		
Current account	0.37	0.10			0.19	0.30		
Inflation (%)	0.26	0.10	0.16	0.13	0.12	0.30	0.34	n.a.
Real interest rate (%)	0.96	0.10	0.09	0.10	1.25	0.10	0.26	0.26
ROECD								
GNP	0.17	0.10	0.24	0.09	-0.15	-0.0	0.44	0.26
Private investment	-0.16	-0.06			-0.30	-0.07		
Private savings	0.20	0.04			0.03	0.03		
Budget deficit	-0.04	0.0			0.08	-0.0		
Current account	0.40	0.10			0.22	0.10		
Inflation (%)	0.24	0.10	0.14	0.12	0.10	0.30	0.37	n.a.
Real interest rate (%)	0.97	0.10	0.02	0.02	1.28	0.10	0.22	0.27
LDCs								
GDP	n.a.	0.2			n.a.	-0.0		
Current account	0.10[1]	0.4			0.20[1]	-0.0		
Terms of trade (%)	-2.83	0.3			-2.06	-0.2		

Source: McKibbin and Sachs (1991); Masson, Symanski and Tyron (1989) and Masson and Helliwell (1990).

Notes: All values represent deviations from baseline as a percent of GNP, unless stated otherwise. 1. Percent of US GNP.

THE WORLD BANK AND THE ENVIRONMENT: THE WORLD DEVELOPMENT REPORT 1992

Lance Taylor

Introduction

"Think globally, act locally" is an environmentalists' maxim that the World Bank has unexpectedly taken to heart. Although not green, the ideas underlying the *World Development Report 1992: Development and the Environment* at least tend toward earth colors; the Bank may be seriously beginning to reflect upon the economic and physical milieu of its borrowing constituency. Moreover, like the 1990 edition on poverty, the latest *World Development Report 1992* (here after called *WDR*) represents a step away from neoliberalism and back toward the Bank's attitude of the 1960s: that the continuing existence of the poor in poor nations is the development problem. Indeed, the *WDR*'s insistence on remedying water and air pollution resembles nothing more strongly than 20-year-old strategies aimed at satisfying developing countries' basic needs.

Despite these favourable signs, there is tension in the document between concern over poor people's water, air, and quality of life, on the one hand, and advocacy of a "market friendly" policy line, on the other. Market-friendliness dominated the 1991 *WDR*, which stressed the virtues of price reform and criticized most market interventions by the State.[1] With regard to environmental concerns, this approach mimics the economics mainstream. In the words of a recent, comprehensive review, "As we move into the 1990s the general political and policy setting is one that is genuinely receptive to market approaches to solving our social problems ... the prevailing atmosphere is a conservative one with a strong disposition toward the use of market incentives ..." (Cropper and Oates, 1992). Whether the market alone is capable of dealing with the two major problems of the post-cold war world - the abysmal standards of living of (by the Bank's estimates) one-fifth of humankind and the rapidly deteriorating global environment with its non-negligible possibility of collapse - is a question that the *WDR* cannot quite bring itself to confront.

The discussion that follows, departs somewhat from the *WDR*'s order of presentation by first taking up questions regarding the robustness of market-based environmental policies (which, to be fair, the *WDR* does not fully endorse) and their institutional and political complications (*WDR*, chapters 1, 3, and 4). Next poverty and population growth are treated (chapter 1), then local and national environmental concerns (chapters 2, 5, 6, and 7). Global environmental and economic issues (chapters 8 and 9) are the final topics, addressed from the viewpoint of (possibly) sustainable growth.

I. The environment, the market and the state

The *WDR*'s treatment of the bases for environmental action is its weakest point. Imprecision on the part of its authors is not surprising; after all, no single person or institution is truly equipped to deal with the huge range of ill-understood problems that nature and culture present. But the *WDR* lacks breadth; despite 500-odd references, the range of opinion it canvasses is slight. One looks in vain for citations to persons such as John Sununu, Julian Simon, Jean Dreze and Amartya Sen, Lester Brown, Gretchen Daily, Paul Erlich, David

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[1] For a summary and critique of the 1991 *World Development Report* (*WDR*), see Fanelli, Frenkel, and Taylor (1992). It views public interventions apart from provision of education, some infrastructure, macroeconomic stability, and the "rules of the game" quite dimly.

Pimentel and George Washington Hayduke.[2] Like any document written by a committee seeking a middle ground that will please its superiors, *WDR* leaves out interesting, controversial points.

As each succeeding *World Development Report* documents, the World Bank's management is ideologically committed to the market; this fact no doubt induced the authors to follow economistic lines. They invoke ecologists and anthropologists, but in the final analysis seem not to take seriously their insistence on the need to preserve and sustain diverse natural and human systems as being both sufficient unto themselves and irreplaceable components of an unfolding global dynamics. Nor does the *WDR* fully recognize that change is constrained by history; in natural terms, by existing ecosystems and gene pools, and in human ones, by the institutions that societies maintain. Despite deploring poverty and recognizing factors such as the "deeper spiritual importance" (p. 57) and "amenity values" of forests and other natural phenomena, the *WDR*'s main thrust is that policy should be decided on the basis of environmental benefits and costs.

Even within this market sphere, the *WDR* could probe deeper into the practical efficacy of different policy lines. According to standard theory dating back to Pigou (1918), pollution taxes are an effective means to control environmental costs. The optimal levy on a polluter's activity is equal to its marginal social damage, at a general equilibrium in which all microeconomic "marginal this = marginal that" conditions are in force. Cropper and Oates (1992) give the details along with the observation that if a pollutee can undertake "defensive activities" against a polluter's incursions, then s/he can be counted upon to do so at an "optimal" level without any help from the State.

But can individuals really "defend" themselves against environmental degradation? Cropper and Oates' conclusion recalls Bertrand Russell's (1945) description of utilitarian economics: "'Free competition,' in orthodox economics, is a very artificial conception, hedged in by legal restrictions. You may undersell a competitor, but you must not murder him ... Those who have not the good fortune to possess capital must not seek to improve their lot by revolution".

Ineffective defensive activities were all that the existing legal system could allow the poor families which used to fish the coral reefs around Palawan Island in the Philippines before they were killed by an influx of eroded soil after the forest cover was denuded by land developers and large, profitable logging companies with close ties to the national government (Broad and Cavanaugh, 1989; *WDR*, p. 49). Alternatively, the villagers may have brought their problems upon themselves by non-optimal overfishing as traditional regulation of the coral "commons" broke down owing to pressures from the market and population growth.

Either way, this example of dying "fish homes" (the Filipino word for coral reefs) suggests that optimal tax rules may not be so easy to apply: especially for the poor, the shapes of the relevant response curves are at best known in highly uncertain fashion; moreover, the State may not be politically free to act (timber barons were pretty good at holding putative regulators in check in the post-Marcos Philippines). Unstable prices as planners fine-tune pollution levies, can be economically disruptive - the market will be unhappy if regulators keep adjusting and readjusting taxes on polluters until either environmental standards or "optimal" equilibrium conditions are met.

Weitzman (1974) tried to cut through this veil of ignorance two decades ago, in response to theoretical suggestions that decentralized planning via price signals might well converge to a social optimum but only after many confusing revisions. As is often the case with good neoclassical economics, Weitzman's theorem embodies common sense: quantity regulation is appropriate when its marginal benefits in reducing damages rise sharply but its marginal costs do not. Inability to control adequately toxic substances via charges on their emission can create high social costs; hence, one should opt for quantitative regulation. Contrariwise, excessive burdens may be imposed on both polluters and society as a whole if marginal benefits from excessively stringent controls are constant but their marginal costs rise at a rapid rate - price-based instruments make more sense under such conditions.

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[2] When he was Presidential advisor, John Sununu's views on the foolishness of attacking environment problems were well covered in the international press, and the following seven scholars will be cited in due course. "Hayduke lives" is the rallying cry of the (sometimes) eco-terrorist Earth First movement. G.W. Hayduke led the original monkey wrench gang in their attacks on environmentally unfriendly capitalists and machines (Abbey, 1975).

Besides adopting Weitzman's distinction between policies which act "... by stipulating standards and regulations (command-and-control policies) or by pricing additional pollution or additional resource use ..." (page 73), the *WDR* adds a few other classifications. First, it separates direct and indirect approaches. The former "... target proxies for environmental damage, such as industrial emissions or timber extraction ..." while the latter "... influence actions only indirectly related to environmental damage, such as the use of leaded gasoline or land" (p. 78). Secondly, the State may act directly to influence choice of technology (with all instruments at its disposal, including public investment). Thirdly, it can try to revise property rights such as land tenure laws and customs to influence environmental outcomes and, finally, it should recognize that interventions such as trade quotas and energy subsidies have repercussions on nature and society via the market.

II. Environmental policies in practice

Chapters 3 and 4 of the *WDR* set out these policy characteristics, and present examples - their general thrust is in favour of market-based incentives but caveats are provided as well. Without going through the lists in detail, a few observations can be made:

(a) One fundamental issue has to do with the environmental implications of new investments; after all, the World Bank is in the business of project lending. The *WDR* recognizes that "... numerous public investments - often supported by development agencies, including the World Bank - have caused damage by failing to take environmental considerations into account or to judge the magnitude of the impacts. Indonesia's transmigration program, Sri Lanka's Mahaweli scheme, and Brazil's Polonoreste projects are examples of large programs that caused unanticipated damage in earlier years" (pp. 13-14). More recently, the Bank used independent evaluators to reassess its Narmada River Basin project in India, and agreed to finance resettlement and rehabilitation of the people adversely affected (*World Bank News*, 25 June, 1992).

The *WDR* argues that sharing information with local residents and applying appropriate cost-benefit analysis procedures can avoid such difficulties. It also recognizes that "... equally important are design issues relating to individual project components - road alignments, the design of water systems, and provision of access to forests and wetlands" (p. 14). Social and environmental awareness is required to address such questions; beyond setting general cost and pricing limits, it is not obvious that market forces have much of a role to play.

(b) There are also complications with the cost-benefit calculus itself. As discussed below (section 4), economists like to think macroeconomically in terms of steadily growing supplies of all commodities. But suppose a good such as "the environment" either will be in increasingly scarce supply or will be a "luxury" with steadily rising demand as income grows (details in section 7) - either way its market and/or socially relevant "shadow" price will go up in comparison to prices of other commodities.

Under such circumstances, with environmental goods becoming relatively more valuable, the theory of externalities discussed above suggests that pollution levies should rise over time. Conversely, investments which create environmental amenities in the future should be favoured now. The World Bank and similar agencies should evaluate environmental projects with low (and perhaps declining) discount rates since their future values as seen from today will fall less rapidly than those of other goods; in the jargon, their "own" rates of interest in terms of non-environmental goods will be low.[3] The *WDR* (p. 34) argues that environmental projects should not be evaluated with low discount rates. Despite decades of professional awareness of the implications of differing own-rates of interest, the *WDR* does not recognize the force of steady trend in relative prices.

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[3] A commodity's "own" rate of interest measures how rapidly its value will fall in the future, as seen from today; when trends in prices diverge, then so will own-interest rates. The argument in the text follows Keynes (1936, Chap. 17) and Kaldor (1960), who emphasized how trending relative prices make economic evaluations based on a single, constant "real" interest rate meaningless. Weitzman (1992) brings out this point in terms of investment project evaluation when there are externalities, and presents an elasticity-based formula for computing an "environmental" interest

(c) Scarcity values of environmental amenities may well rise, but the effects on resource allocation are likely to be weak. In order to address most practical problems, mixes of new investment and price, quantity, and technology policies will be applied. For example, the *WDR*'s box 3.4 gives a useful description of how technical shifts (engine retrofits, vapour recovery, the use of low-lead gasoline, etc.), vehicle emission standards and inspection, and higher fuel taxes may be able to make a dent on Mexico City's air pollution. The cost curve for cutting emissions is shifted downward by the gasoline tax, but not by very much. Indeed, in several examples highlighted in the *WDR*, price reform appears to be substantially less effective than technical change in improving environmental conditions.[4]

(d) *WDR*'s repeated injunctions to developing countries to cut subsidies on energy and fertilizer and water use (many low price/cost ratios are illustrated in *WDR*, figure 3.2) may therefore not lead to much environmental response. The fiscal improvements that subsidy reductions could bring may be far more important in that they would permit more environment-friendly public investment, as will be discussed shortly (c.f. section 6).

(e) The relatively weak response to price reform implies that "marginal abatement cost" curves for polluting activities are low and fairly flat, which conforms to economic intuition. Environmental protection is in its early days in the developing world. In terms of Weitzman's (1974) model, relatively blunt quantitative controls may be more cost-effective than sophisticated market manipulation, at least until decreasing returns to command-and-control (CAC) efforts begin to kick in. Moreover, the performance record of market-based policies is not extensive. The entire worldwide corps of interventions such as effluent charges, emissions permits, and performance bonds is marshalled in *WDR*'s table 3.1 - its numbers can be counted on two hands. As Cropper and Oates (1992) take pains to point out, several programmes are essentially trial runs and others boil down to stimulating "transactions" about polluting activities within plants or firms.

(f) There is a also a behavioural reason for opting for CAC regulation, which *WDR* does not bring out. It may be effective in changing how people think and not just act (in economists' terms, CAC can influence preferences and technology, not just choice). Both buyers and sellers of cars are now far more concerned with the dangers of emissions in the United States than they were a generation ago - bureaucratically onerous standards played a role in this particular act of consciousness-raising.

(g) CAC interventions can also help keep environment-friendly social structures in place. The *WDR*'s box 4.4, for example, beautifully describes the reverence for nature that permeates many traditional cultures; as the authors fully recognize, one of its attributes is the maintenance of common property resources. The literature is full of examples of how opening local societies to the full rigors of the price system can lead to both economic misery and environmental loss; in many cases, it appears that traditional activities would have been better served by protective barriers than attempts at stimulating markets.[5] Even apart from traditional cultures, the *WDR* rightly emphasizes the importance of community action and local decision-making

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rate as a fraction (perhaps falling over time) of the market rate. Both the WDR and the World Bank's chief economist Lawrence Summers (1992) fail to consider own-interest and Weitzman-style corrections.

[4] See box 3 in the "Overview" on air pollution, box 3.4 on Mexico City's smog, figure 5.6 on water supply and sanitation, figure 6.5 on air pollution from electric power generation, and figure 6.9 on motor vehicle emissions. Table 8.1 is a partial exception in projecting large reductions in carbon dioxide emissions due to cutting subsidies to commercial energy use in Eastern Europe and the former USSR (by 29 per cent as opposed to 11 per cent in developing countries). But it should be recognized that a massive extrapolation from the existing situation is involved.

[5] Just two examples are given. Early on, Feder (1977) described how tax concessions and infrastructure investment led to disenfranchisement of small scale farmers by cattle ranching in the Brazilian Amazon; traditional forest dwellers were made destitute and in some cases simply wiped out. Jodha (1986) documents how common property resources in the Indian state of Rajasthan have been reduced by privatization associated with land reform programmes unaccompanied by public support for required capital formation and social safety nets.

about environmental issues. Such healthy institutions cannot just be fostered by the market, which at its worst will generate ample side payments to ensure that polluting activities take place NIMBY or "not in my backyard."

(h) Observations along similar lines apply in the area of foreign trade. The *WDR* follows the World Bank line in stressing the market-friendly nature of external trade: "Liberalized trade fosters greater efficiency and higher productivity and may ... encour[age] the growth of less-polluting industries and the adoption and diffusion of cleaner technologies" (box 3.1). Although the Bank never admits it, the assertions about efficiency and productivity are controversial; how more free trade will lead to cleaner technologies is not documented fully in the *WDR*.[6]

Indeed, some economic logic points the other way. An internal World Bank memo attributed to chief economist Lawrence Summers and leaked to Greenpeace and the *Economist* (14 February, 1992) even asserted that it is cost-effective to site pollution-intensive industries in low-wage economies where the loss of earnings due to increased mortality and morbidity is small. Moreover, "only the lamentable facts that so much pollution is generated by non-traded industries ... and that the unit transport costs of solid waste are so high prevent world welfare-enhancing trade in air pollution and waste." Prudently, the *WDR*'s box 3.1 takes the opposite tack, asserting that "... developing countries do not compete for foreign investment in 'dirty' industries by lowering their environmental standards."

The problem, of course, is that there are potentially severe conflicts between liberalized trade and environmental standards. Trade restrictions are visible, easy to apply, and can be effective; that is why they have played a big role in the Montreal Protocol, aimed at reducing atmospheric ozone depletion by limiting chlorofluorocarbon (CFC) gas emissions, and in the Convention on International Trade in Endangered Species (CITES) embargo on the ivory trade. They also can give rise to political conflicts in which environmental activists are on strong ground.[7] The basic disagreement is that advocates of liberal trade want maximum limits on the stringency of regulatory standards that individual countries can impose, while the environmental community wants minimums. The Bank can't have it both ways.

(i) Although non-price interventions can be justified in many circumstances, they bring their own problems. One is that they inevitably involve spending, either mandated to the private sector (e.g. motor vehicle emission standards in the United States) or undertaken by the public authorities. There are obvious limits to such actions. The private sector can only be pushed so far while government outlays in much of the developing world are restained by the international conjuncture that developed during the 1980s. Downward trends in primary commodity terms-of-trade,[8] the debt crisis, and the stagnation of overseas development assistance all made foreign resources extremely scarce, especially in Latin American and sub-Saharan Africa.

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[6] The strengths and weaknesses of liberal versus interventionist trade and industrial policies in promoting growth are discussed by Fanelli, Frenkel, and Taylor (1992). They conclude that "... there is room for debate about such questions, unacknowledged by the 1991 *WDR*." The current *WDR*'s example of how free trade helps cut pollution is thermochemical pulping in the paper industry, originally developed in response to United States and European environmental regulation. Adoption elsewhere is said to have been " ... quicker in developing countries with fewer trade restrictions. As late as 1989, not a single pulp producer in Eastern Europe had adopted this technology" (p. 68). In the socialist Europe of the late 1980s, how many factors besides trade regulation were impinging on this investment choice?

[7] Two more examples: A Danish regulation mandating that beer and soft drinks be sold in reusable containers was challenged by the European Community (EC) as an impediment to free trade under the Treaty of Rome. The European Court first ruled against Denmark but then reversed itself and ruled against the EC. A United States ban on imports of tuna caught by the encircling net method (which kills many dolphins) was challenged by Mexico under the GATT code; a panel ruled that the United States law was contrary to GATT's equal treatment provisions. The United States and Mexico have yet to put the case before the full GATT council, partly owing to their ongoing negotiations on free trade but also because (as one American Congressman put it) "dolphins have lots of votes."

[8] In its box 1.4, the 1992 *WDR* recognizes declines in real metals and energy prices (both since the 1970s and over this century), and argues that they signal that natural resources are not imminently in short supply. Box 5.5 in the 1991 *WDR* minimized these price movements and argued that their adverse effects on exporters were small. The two boxes do not directly contradict one another, but they do reveal a temptation of the Bank to read statistics in more than one way.

Fiscal receipts were similarly affected, putting severe restrictions on public outlays including those for the environment. The linked macroeconomic and environmental implications of this "fiscal gap" are taken up quantitatively in section 6.

(j) More generally, there is no consensus on how macroeconomic factors and policy choices interact in determining developing country growth (let alone the effects of growth on the environment). Fanelli, Frenkel, and Taylor (1992) and the authors of country studies collected in Taylor (1993) argue that foreign exchange restrictions on imports and public capital formation held down third world economic performance in the 1980s. By contrast, the 1992 *WDR* insists on the absence of sufficiently market friendly policy as the explanation for poor performance. It draws on the previous year's version in asserting that "... countries with good economic policies had average growth rates fully 2.5 percentage points higher than those with middling and poor policies and nearly 1 percent higher than the average projected growth rate for the 1990s" (p. 174).[9]

Questions about the self-assurance of World Bank economists inevitably arise: Can we really determine the relative extents to which unfavourable circumstances and market unfriendly policies were responsible for slow growth? Which will more strongly block creation of new resources for environmental or anti-poverty programmes? With its penchant for self-citation, the World Bank has a hard time admitting that opinions differ about the answers to these queries.

(k) A final set of uncertainties surrounds the role of the State. The *WDR* continually takes little swipes at public enterprises, which allegedly will not respond to market-oriented environmental policies because of congenitally soft budget constraints. (The accusation is overstated, but even when it does apply, why not employ targeted, direct policies instead?) Inept bureaucrats also come in for the authors' wrath. But the *WDR* also recognizes that no agency besides the State is likely to try to establish local citizen participation in environmental choices, protect the poor, or "close the skills gap" (p. 91). In a field as rife with economic externalities and political conflicts as the environment, there is an obvious need for a public presence, even if it consists of nothing more than market-cum-environment friendly interventions. How the State can be established as a beneficial environmental actor is an issue that the *WDR* does not address.[10]

III. Poverty

The *WDR*'s discussion of poverty underscores sensible points, but tends to be narrow and brief. Macroeconomically, it is far more straightforward than the 1991 *WDR*. There was a negligible reduction in the population share and an 80 million increase in the number of people falling below a poverty line of US$370 annual income per person (1985 purchasing power parity) between 1985 and 1990. The total of poor people in the latter year was over 1.1 billion from a developing country population of 3.8 billion. These depressing recent developments are attributed to slow output growth (due to bad policy or bad luck?); mention is also made of the worsened position of the poorest in China as it embraced market liberalization in the second part of the 1980s (*WDR*, p. 29).

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[9] The word "had" in the quotation is misleading. The numbers come from table 8.1 of the 1991 *WDR* and are based on model simulations by Bank country economists, who arguably have a vested interest in projecting favourable outcomes during the 1990s to the policies that they recommended. The *1991 WDR*'s table 1.5 (apparently put together by central Bank staff) postulates growth rate increments of a few tenths of percent in response to market friendliness. On a similar point, the 1992 *WDR*'s assertion that "Experience has shown that, on average, the effect of domestic policies on long-run growth is about twice as large as the effects attributable to changes in external conditions..." (p. 32) is based on 1991 econometrics subject to considerable doubt (Frenkel, Fanelli, and Taylor, 1992).

[10] In particular, box 4.5 mentions Japan's " ... stringent government regulations and negotiations between industry and communities ..." but fails to acknowledge the all-encompassing economic role of that nation's State.

At the local level, one can scarcely quarrel with the *WDR*'s (and Bertrand Russell's) contention that the poor are not in a position to buy their way out of ecological trouble even if they are furiously optimizing "defensive activities" within their feasible decision space, and would be less likely to run down natural resource endowments to survive in times of crisis if there were adequate social safety nets in place. Their weakness precisely creates room for the State to intervene. But just what is it supposed to do?

Dreze and Sen (1989) provide some guidance with regard to hunger. They agree with the *WDR* in pointing out that the poor lack "entitlements" or claims to the social product. In acute famine situations their purchasing power can be severely squeezed by spiraling prices which act to reduce aggregate demand; a friendly solution to this market failure is to give stricken people cash (say as wages in public works programmes) and let the private sector handle food distribution. Chronic hunger has been attacked best by directly supporting the spending power of the poor, or else by making sure that they participate in the fruit of growth.[11]

Similar logic applies in other spheres as well. As seen above, the *WDR* correctly emphasizes the importance of protecting traditional societies with their (typically) conservationist practices; the *WDR* further argues that the property rights of the poor should be supported in general. But why the market alone (or even supplemented by the State) can be counted upon to ratify such institutional changes is not made clear. Bertrand Russell's pessimism continues to apply: entitlements always flow easily into the hands of those with power in the first place.

IV. Population growth

Population growth is an even more contentious area, around which the *WDR* simply (but perhaps unavoidably) waffles. There are several topics now under intense debate; the Bank's authors do their best not to choose sides.

One set of doubts concerns the apparently straightforward task of making population growth projections. The *WDR* looks at three cases: a base, and variants with slow and rapid fertility declines. In the base run, the steady state population is about 12.5 billion in the middle of the twenty-second century. A rapid fertility decline over the next few decades would lower this figure to 10.1 billion and a slow decline would make it 23 billion. As in any exponential growth process, small shifts in rates of expansion cumulate into big differences in levels. Economic implications of this twist of mathematics will be taken up below.

The differences in fertility reductions between the low and high projections correspond to observations in countries where birth rates have dropped off rapidly (Costa Rica, Thailand) or slowly (Paraguay, Turkey). Which experiences are better predictors of the future is an open question. Perhaps the high fertility scenario will be more relevant if per capita income growth remains slow, postponing a demographic transition to lower birth rates. Such a vicious circle could be underway in sub-Saharan Africa, for example (*WDR*'s box 1.1).

The World Bank's assumptions about mortality are not spelled out in the *WDR*. However the *WDR* population projections may be far too high. The *WDR* tiptoes around the implications of AIDS, although recent, controversial growth forecasts which factor in mortality due to the pandemic suggest that populations may begin to decline in central Africa as early as the year 2002 (*New York Times*, 22 June, 1992). This scenario differs sharply from the *WDR*'s, in which "... the AIDS virus could reduce African population growth rates by as much as 0.5-1.0 percentage points in the early decades of the next century" (*WDR*, p. 26). If high mortality from AIDS spreads beyond Africa (say to Thailand and parts of India), this latest twentieth century tragedy will make all population projections moot. Its implications for destitution and social breakdown are somber at best.

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[11] Of the 10 countries which performed best in reducing under-5 mortality between 1960 and 1985, Chile, Costa Rica, Cuba, China, and Jamaica followed the first "support-led" strategy and Hong Kong, United Arab Emirates, Kuwait, Singapore, and the Republic of Korea the second "growth-mediated" approach. Lacking targeted intervention, some rapid growers such as Oman and Brazil pursued "unaimed opulence" which did not alleviate hunger and deprivation.

Suppose, perhaps optimistically, that population increases proceed more or less as the World Bank foresees. What are the implications for the environment? Here, there is wide divergence in views among experts and professions. To summarize them briefly, the general issues will be dealt with before the specifics.

As noted above (section 2), economists like to think in terms of growth equilibria. That is, a set of parameters can be used to describe macroeconomic balance when the economy is expanding exponentially. "Small" changes in one parameter (say, the population growth rate) can be compensated by little movements in others (say, the saving rate or capital-output ratio) to sustain equilibrium.[12] If the invisible hand works its magic through prices which vary to mediate these adjustments, then so much the better.[13]

The *WDR* adheres to the economists' model, especially in emphasizing the equilibrating role of prices. For example, the reader is informed that the "... reason why some resources - water, forests, and clean air - are under siege while others - metals, minerals, and energy - are not is that scarcity of the latter is reflected in market prices and so the forces of substitution, technical progress, and structural change are strong." (*WDR*, page 9) Other scholars, typically from different disciplines, stress that there are environmental ceilings which ultimately can limit global economic growth. Such neo-Malthusian views have swung in and out of favour since the *Essay on Population* was published 196 years ago. They are at the moment quite influential; moreover, Malthus may at long last be proved right. Four sorts of potential barriers to continued output growth are worth flagging:

(a) According to the *WDR*, " ... apart from small islands and city-states, only Bangladesh, the Republic of Korea, the Netherlands, and the island of Java ... have [population] densities exceeding 400 per square kilometer. By the middle of the next century, however, one-third of the world's population will probably live in countries with these ... densities" (*WDR*, p. 7). The stress on ecosystems in countries which are not amply endowed with water and/or industry could be intense; already severe degradation is taking place in arid and semi-arid areas, e.g. in sub-Saharan Africa. Solutions will require action by both public and private sectors. Even the *WDR* admits that "Markets are ... inadequate for spreading risks in drought-prone regions because so many people are affected at once" (*WDR*, box 1.2).

(b) Besides the problems posed by high population densities *per se*, there are other local and national environmental constraints which are discussed in the following sections. If they begin to bind, then the trade-off between growth in output per head and population increases could become acute. Some problems such as deforestation and associated losses in biodiversity owing to species extinction spill over into the global arena.

(c) Global warming owing to emissions of the "greenhouse gases" (GHGs) - carbon dioxide, methane, CFCs, and nitrous oxide - could severely destabilize ecosystems worldwide as soon as the middle of the next century. Broadly speaking, GHG emissions rise with total GDP, i.e. increases in both income per capita and population. The *WDR* does not mention it, but limiting GHG emissions could set up a political confrontation between poor countries with expanding populations which want to raise their per capita outputs (say, in India and China, by exploiting large national coal reserves with correspondingly high particulate and carbon dioxide emissions) and rich countries with slow population growth but high (though stable) emissions per head. Of course, the rich countries have been responsible for the bulk of GHG (not to mention CFC) production since their industrialization began 200 to 300 years ago.

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[12] The arithmetic of adjustments around growth equilibrium at constant per capita income can be illustrated with a Harrod-Domar equation between output growth to the left of the equal sign and population growth to the right: $(s/k) - \delta = n$, where s is the national saving rate, k is the capital-output ratio, δ is the rate at which the capital stock depreciates, and n is the population growth rate. Suppose initially the numbers take the values $(0.15/3) - 0.02 = 0.03$. Then an increase in n from 0.03 to 0.035 (a big change) can be compensated by an increase in s from 0.15 to 0.165 or a fall in k from 3 to 2.73, both of which are moderate adjustments.

[13] Faith in the ability of the market and society overall to adjust to changing population growth rates characterizes optimists like Simon (1981), who argues that faster increases improve the human condition. In the 1984 *WDR* devoted to population issues, the World Bank took the middling to pessimistic view of the effects of population expansion on output growth which was characteristic of pre-Reaganite Washington orthodoxy; since then, its statements prior to the 1992 *WDR* have tended to move in the optimistic direction.

(d) As Malthus feared long ago, food supply could become scarce. The *WDR* rightly points out (*WDR*, figure 7.1) that world cereal production almost doubled from 1.0 billion to 1.9 billion tons between 1965 and 1990, owing to an increase of a few per cent in cropped area and a big expansion in yields per hectare. Can output rise further to 3.6 billion tons by 2030 to meet the Bank's baseline population growth projection?

Even ignoring the (largely unknown) implications of global warming, the answer will depend on limiting factors affecting agriculture in different parts of the developing world, e.g. (i) the absence of unused land in South and East Asia and the Middle East; (ii) an increasing scarcity everywhere of suitable sites for new irrigation projects along with rising investment costs; (iii) non-agricultural demands for land and water; (iv) competition of non-staple crops, animals, and export crops for resources which could be used to produce basic foods; (v) no real research breakthroughs in raising yields for coarse grains and roots and tubers like the "green revolution" for rice and wheat; and (vi) observed yield decreases for "green revolution" crops in the 1980s owing to new diseases, increasingly pesticide-resistant insects, depletion of soil micronutrients, and waterlogging and salinization associated with irrigation.

Some specialists find the yield trends and other factors just mentioned extremely disquieting.[14] However, the *WDR* believes that "... long-term observation will make possible understanding and management of these problems" (*WDR*, box 7.3). If the *WDR* is correct about sustainable yields for high-intensity agriculture and prospects for conservationist farming and integrated low-intensity operations involving staple foods, forage, forestry, and ruminants (*WDR*, table 7.2 and box 7.1), then doubling food supplies between 1990 and 2030 may well be feasible. But it will certainly be no mean task.

To summarize, if the world's population doubles (with most of the increase occurring in developing countries) over the next 40 years, this factor could be a source of substantial pressure on the environment - especially if output per capita grows steadily as well. The *WDR* follows the majority of economists in working with projection models which preclude strict environmental limits to growth. A question which any serious report should entertain is whether exponential output expansion will cease to be feasible in the decades to come. The implicit view of the World Bank is that this risk is slight. It would be reassuring to know the reasons why.

V. Water, industry, energy, motor vehicles and agriculture

When the *WDR* stops trying to think globally and discusses policy actions locally, it is on firmer ground. Chapter 2 of the *WDR* gives a sympathetic assessment of the environmental problems that poor people in developing countries face - unsafe water, inadequate sanitation, soil depletion, indoor smoke from cooking and heating fires, and outdoor smoke from coal burning - while chapters 5-7 suggest policy solutions. Some are sensible; others suffer from the deficiencies noted in sections 1 and 2 above.

If clean water and sanitation are not adequately provided, the poor (especially children suffering from diarrheal diseases and women who spend immense amounts of time carrying water) bear the brunt of the social costs. The *WDR* presents both urban and rural examples to suggest that families might be willing to pay for improved water supply. At the retail level - with adequate regulation - private companies may be able to hold down delivery costs.

These pieces of evidence, which "... draw heavily on the cumulative experience of the World Bank water sector staff" (*WDR*, p. 180), lead the *WDR* to recommend that water supply should be privatized to the extent possible, despite the fact that "private involvement in the sector is not a panacea and is never simple. In the United Kingdom water privatization is generally considered to be the most complex of all privatizations undertaken" (*WDR*, p. 111). Even if private water delivery (with associated public regulation) was put in place, the Bank has estimated that sustained investment in facilities would still have to rise by about 0.1 per cent of GDP to help "... bring about dramatic increases in access to sanitation and clean water within the next generation" (*WDR*, p. 113).[15]

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[14] See Daily and Ehrlich (1990) and Pimentel (1991). These authors are known for producing pessimistic scenarios. But does that mean the World Bank can rule them irrelevant to the debate?

The corresponding extra investment in sanitation would be of the same magnitude, but privatization of service delivery (especially for treatment and disposal of sewage and solid wastes) may prove less attractive. Successful programmes from Recife and the Orangi squatter settlement outside Karachi are put forward to suggest that community-organized sewage collection schemes can be effectively implemented. This observation is no doubt true, but it also bears noting that Recife's "condominial" collection system has not taken hold elsewhere in Brazil and the Orangi programme is one of several improvements in that settlement organized by Akhter Hameed Khan, a politically well-connected, charismatic leader. In the absence of such a powerhouse, the task of organizing sewerage projects may have to fall back on local cadres of the State.

With regard to air pollution, residents and visitors in such places as Beijing and New Delhi can attest that levels of "suspended particulate matter" (good old soot and dust, or SPM) in their air can be apalling; on bad days, the atmosphere in Mexico City and Bangkok is poisonous with motor vehicle smog.[16] In total, 1.35 billion urban dwellers in developing countries lived in cities with SPM levels exceeding (relatively stringent) World Health Organization norms in the mid-1980s (*WDR*, figure 2.4). About 500,000 premature deaths per year could be averted if SPM concentrations were brought down to levels deemed safer by WHO guidelines. Respiratory ill health, especially among women and children, is also provoked by indoor pollution from cooking and heating with biomass (wood, straw, and dung) and coal - perhaps 400 to 700 million people are exposed to such risks.

The *WDR's* chapter 6 recommendations about how to deal with these problems are a mixed bag. Urban pollution comes from electricity generation, industry, and motor vehicles. Each source has to be dealt with on its own terms. Price reform is emphasized in all cases, but as observed in note 3, the chapter's diagrams suggest that its efficacy in reducing emissions is considerably less than abatement measures - all of which cost real money. The annual investments required for cutting emissions from coal-fired power stations, controlling motor vehicle emissions and switching to unleaded fuels, and reducing emissions, effluents, and wastes from industry would all amount to 0.1 per cent to 0.3 per cent of developing country GDP on a sustained basis.

The *WDR* also points out that new technologies (not just imports of existing industrial country techniques) can play a role in mitigating these pollution problems. It is relatively sanguine about prospects for solar power (*WDR*, pp. 122-123) and recognizes that nuclear power generation is not cheap. Mass production of improved biomass stoves is proposed. The *WDR* stresses that subsidies on some technologies and taxes on others (e.g. on carbon use), as well as substantially increased spending on research and development will be required if these innovations are to fulfil their promise.

Research and development will also be crucial to agriculture, for example, in finding ways to reverse the trend toward lower yields mentioned above as well as to attack soil losses, salinization, and other problems. However, such expenditures stagnated in the 1980s and still concentrate more on commodity programmes than on integrated approaches to the sociocultural riddles that the sector presents. Maintaining common property ownership systems that help assure sustainable resource management by communities (*WDR*, pp. 142-144) is a case in point. Research is needed to generate concrete proposals about how this goal can be assured. Political action may also be required. The *WDR* points out that security of land tenure (either familial or communal) can be essential to reduce poverty and defend the environment, but somehow fails to mention land reform.

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[15] This goal presupposes that overall water supplies will be "adequate." Economics is necessarily involved in defining the term, but with rapidly growing populations absolute water supply limits may begin to bind in arid regions of the Middle East and elsewhere.

[16] Besides damaging respiratory systems, vehicle smog also can lead to high blood levels of lead, contributing to IQ loss in children and hypertension in adults. The problem is endemic in Bangkok, Mexico City, and elsewhere.

Other agriculture-related questions singled out for discussion include management of forests and preservation of diverse habitats and species. Along with global warming, both topics were subject to intense debate at the United Nations Conference on the Environment and Development (UNCED) held in Rio de Janeiro in June 1992.

One major issue in forestry is overcutting in humid, tropical areas. During the past decade or so, Thailand and the Philippines have been logged out, and the State of Sabah in Malaysia will soon follow suit. Economists such as Repetto and Gillis (1988) attribute such boom-and-bust exploitation to two factors - concessions granted to private sector logging companies are valid for only a few years so that they have no incentive to engage in sustainable yield forestry, and log export restrictions imposed in the hope of promoting domestic industry tend to hold down current "stumpage value" (the difference between log prices and logging costs) and thereby the discounted net worth of the standing forest.

To the extent that this analysis is correct, it raises questions about who should capture stumpage value - long-term concessionaires or the State through appropriate regulation of short-term contracts? Either approach could help lead toward sustainable yield forestry, but practical difficulties often arise, e.g. State Governments in Malaysia have awarded profitable short-term concessions with low stumpage fees because they are under-financed from the centre.

More fundamentally, there is a question as to whether "correct" economic incentives will be sufficient to prevent buccaneers from making fast profits - recall that discount rates are supposed to be high in poor economies. If rapid exploitation is the rule - as suggested by several centuries of raw materials' booms under capitalism in both now developed and developing countries - then to the extent possible public control may be required to protect tropical forests.

One reason why the world market may opt for preservation of forests and other endangered ecosystems is biodiversity - there can be substantial pay-offs to development of new pharmaceuticals and other biological products on the basis of chemicals found in nature. The classic example is the isolation in 1954 of two cancer-fighting alkaloids from the rosy periwinkle of Madagascar by Eli Lilly and Co. By the time the patents had run out, Eli Lilly had made hundreds of millions of dollars from these drugs, and Madagascar not one penny (*Science*, 19 June 1992).

This potential conflict between tropical country suppliers and industrial country users of their products underlay the debate about the biodiversity treaty at the United Nations Conference on Environment and Development (UNCED) meeting, which, at the prompting of its biotechnology industry, the United States refused to sign. While the treaty was being discussed, Merck and Co. (another United States drug firm) agreed to pay Costa Rica US$1 million for the right to analyse hundreds of indigenous plant and animal extracts for possible commercial uses, plus an undisclosed royalty on any marketable product. Whether this deal will be market and environment-friendly in Costa Rica remains to be determined. As is often the case when a transnational corporation deals with a developing host country, the price that Merck paid for access may not have been excessively high.

VI. International resource transfers

The environment presents challenges to developing countries and the world in many dimensions - natural, cultural, political, and economic. All aspects were debated at the UNCED Rio meeting, some without sharp resolution (e.g. weak wording in the convention on means to address global warming) and others in conflict (the biodiversity treaty). The volume of resources needed by developing countries to attack their environmental problems was also discussed. The macroeconomic implications are taken up in this section.

The table below gives two sets of estimates of the yearly spending required to reach plausible environmental targets in the reference year 2000 (at which point GDP in the developing world might be a bit more than US$5 trillion in 1990 prices). The first comes from the *WDR*'s figures, as discussed above, and the second from the World Institute for Development

ESTIMATES OF ENVIRONMENTAL RESTORATION COSTS IN THE YEAR 2000

(Billions of 1990 dollars per year)

	World Bank	*WIDER*
Investment in water and sanitation	10	
Reducing emissions from coal-fired power stations	7	
Reducing motor vehicle pollution	10	
Reducing industrial pollution	10-15	
Raising energy efficiency		11
Developing renewable energy		15
Agriculture and forestry programmes	20-25	23
Family planning (including more education for girls, financial incentives, etc.)	8	33
Total	65-75	82

Source: : *World Development Report* 1992, Development and the Environment, table 9.2; Jayawardena (1991).

Economics Research (WIDER) as summarized by Jayawardena (1991).[17] Substantial outlays are obviously involved - an initial difficulty is that their proposed destinations as specified by the *WDR* and WIDER differ in ways that illustrate conflicting priorities in the environmental debate.

The *WDR* targets US$37 to 42 billion to the local and national problems that it emphasizes - water and air pollution, sanitation, and cleaning up industrial emissions, effluents, and wastes. In contrast, WIDER proposes US$11 billion for raising energy efficiency (which partly overlaps with the *WDR's* industrial recommendations) and US$15 billion for putting renewable energy generation in place. Along with family planning and related activities (for which WIDER allocates US$33 billion), renewable energy production is a first world environmentalists' concern. As seen from the North, both population control and renewable energy reduce the risks of global warming in a politically palatable way. Arguably, poor people in the South are more concerned with quality of life as highlighted in the World Bank's spending recommendations (and might not even mind using more energy, regardless of how it is manufactured). Finally, both sources suggest that over US$20 billion per year will be needed to assure agricultural sustainability and output growth.

Without trying to judge the conflicting motivations behind the table, its bottom line is that if both developed and developing countries' environmental priorities for the third world are addressed, then well over US$100 billion in annual outlays might be required in the year 2000 - roughly 2 per cent of developing countries' total GDP and 0.35 per cent of the world's.

This is not a trivial sum, even on the world scale. It bears recollection that the first and second oil shocks, the Volcker interest rate shock around 1980, and the famous American twin deficits five years later all amounted to around 1 per cent of world GDP and made the system ring like a bell. The adverse external shock that poor economies received from falling terms of trade and the debt crisis in the 1980s was about 3 per cent of their GDP, and authors such as Fanelli, Frenkel, and Taylor (1992) (*op. cit.*) argue that it was directly responsible for a "lost decade" of growth in Latin America and sub-Saharan Africa. The renewed capital inflows required to support "socially necessary" output growth rates (Taylor, 1992), plus environmental outlays as advocated by both the World Bank and WIDER in the table above might sum to over 4 per cent of developing country GDP and almost 1 per cent of the global total. Even if such flows did not strongly perturb the system, where could the money come from?

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[17] The WIDER cost estimates are based on in-house research coordinated by Partha Dasgupta and Karl-Göran Mäler and on Lester Brown, *et al.* (1988), with the latter source providing the cost figures for population control (World Institute for Development Economics Research (WIDER)).

A rise in internal third world savings rates by several points of GDP is not likely; nor would the "Keynesian" problem of converting the extra saving into physically and environmentally productive investment be easy to solve. Fiscal questions arise as well, since a substantial environmental effort would be required by a public sector which was almost obliterated in some countries by austerity programmes during the 1980s. Indeed, as emphasized by a new generation of "three gap" models (Taylor, 1993), fiscal, saving, and external restrictions on growth (and by extension, environmental improvement) are indissolubly linked. The private sector certainly has a role to play in ecological and cultural renewal, but as we have observed, it cannot carry the burden alone.

Resources from developed economies are also likely to be in short supply. During the late 1980s, South to North transfers were on the order of US$100 billion per year. These flows slackened somewhat in the early 1990s (and even reversed for some countries owing to direct foreign investment and repatriation of previous capital flight), but any net flow southward still falls well short of the magnitudes required to break the foreign exchange and fiscal bottlenecks to satisfying growth and environmental needs. The industrial countries have pressing internal demands and will try to fill a huge financial gulf in the former socialist economies. Unless their priorities change, they are not likely to open their purses wide for environmental concerns in the third world.

The question of priorities, however, remains unresolved. Historically, "if a single lesson can be drawn from the early history of conservation, it is that States will act to prevent environmental degradation only when their economic interests are shown to be directly threatened" (Grove, 1992). Between developed countries' fear of global warming and the quest for profits from biodiversity - (a potentially handsome economic gain) - it may be that an annual US$100 billion southward flow by the end of the decade will be in place. But the poor economies should keep their fingers crossed.

VII. Conclusions

One interesting exercise in the *WDR* follows Kuznets and Chenery in tying environmental indicators to per capita GDP (figure 4 in the *WDR* Overview). In cross-country statistical averages, the shares of the population without safe water and (urban) sanitation fall steadily to around 20 per cent when national per capita income is about US$2000 (in the World Bank's "upper middle income" range) and continue more slowly downward at higher income levels. In the urban air, SPM declines from a peak of 1200 micrograms per cubic metre to an "acceptable" level of 100 micrograms above an income level of US$10,000. These indicators all suggest that improving the environment is a "luxury" along the lines discussed in section 2.

Other measures, however, seem to point the other way. For example, carbon dioxide emissions per capita are low in poor countries, and commence to rise steeply at upper middle income levels toward the rich country figure of 15 tons per year. This tendency again underlines developing and developed countries' asymmetrical contributions to global warming. If emissions as a function of per capita income stabilize at some level in the future (which apparently will be required to avoid catastrophic warming in the long run), we will have another example of an income-elastic environmental response.

These relationships suggest that countries have different "tastes" and deploy different technologies to deal with environmental problems at diverse income levels. According to the

WDR, the curves have moved downward somewhat over time, "... providing an opportunity for countries to develop in a less damaging manner than was possible earlier" (*WDR*, p. 10). This thought is hopeful, but does not get the environment very far. Given the cost estimates discussed in section 6, major gains will be unlikely in the short to medium run unless public preferences shift in their favour and/or new abatement technologies come onto the scene. The market can support such developments, but they have to be initiated by enlightened public opinion and the State. As an important actor, both economically and in terms of shaping international points of view, the World Bank can play a big role in helping these processes along. Its obsession with market-friendliness notwithstanding, the latest *World Development Report* represents an excellent start.

References

Abbey, Edward (1975), *The Monkey Wrench Gang*, New York: Avon Broad, Robin, and John Cavanaugh (1989) "Marcos's Ghost," *The Amicus Journal, 11* (4): 18-29.

Brown, Lester R., *et al.* (1988), *State of the World 1988*, New York: W. W. Norton (for the Worldwatch Institute).

Cropper, Maureen L., and Wallace E. Oates (1992), "Environmental Economics: A Survey," *Journal of Economic Literature*, 30: 675-740.

Daily, Gretchen and Paul Ehrlich (1990), "An Exploratory Model of the Impact of Rapid Climate Change on the World Food Situation," *Proceedings of the Royal Society of London, 241* (No. 1302): 232-244 (Series B).

Dreze, Jean and Amartya Sen (1989), *Hunger and Public Action*, Oxford: Clarendon Press.

Fanelli, Jose Maria, Roberto Frenkel and Lance Taylor (1992), *The World Development Report 1991. A Critical Assessment*, report prepared for the Group of 24.

Feder, Ernest (1977), "Agribusiness and the Elimination of Latin America's Rural Proletariat," *World Development*, 5: 559-571.

Grove, Richard H. (1992), "Origins of Western Environmentalism," *Scientific American*, 267 (1): 42-47.

Jayawardena, Lal (1991), "A Global Environmental Compact for Sustainable Development: Resource Requirements and Mechanisms," Helsinki: WIDER.

Jodha, N. S. (1986), "Common Property Resources and the Rural Poor in Dry Regions of India," *Economic and Political Weekly*, 21: 1169-1181.

Kaldor, Nicholas (1960), "Keynes' Theory of the Own-Rate of Interest," in *Collected Economic Essays* (Vol. II), London: Duckworth.

Keynes, John Maynard (1936), *The General Theory of Employment, Interest, and Money*, London: Macmillan.

Pigou, A. C. (1918), *The Economics of Welfare*, London: Macmillan.

Pimentel, David (1991), "Global Warming, Population Growth, and Natural Resources for Food Production," *Society and Natural Resources, 4*: 347-363.

Repetto, Robert and Malcolm Gillis (eds.) (1988), *Public Policies and the Misuse of Forest Resources*, Cambridge: Cambridge Univerity Press.

Russell, Bertrand (1945), *A History of Western Philosophy*, New York: Simon and Schuster.

Simon, Julian L. (1981), *The Ultimate Resource*, Princeton NJ: Princeton University Press.

Summers, Lawrence (1992), "Summers on Sustainable Growth," *The Economist*, 30 May, p. 65.

Taylor, Lance (ed.) (1993), *The Rocky Road to Reform*, Cambridge MA: MIT Press.

Tewari, Meenu (1990), "The State, Intersectoral Linkages, and the Historical Conditions of Accumulation in Ludiana's Industrial Regime", Cambridge, MA: Department of Urban Studies and Planning, Massachusetts Institute of Technology.

Weitzman, Martin L. (1974), "Prices vs. Quantities," *Review of Economic Studies*, 41: 477-491.

----- (1992), "On the 'Environmental' Discount Rate," Cambridge MA: Department of Economics, Harvard University.

World Bank (1992), *World Development Report 1992*, Development and the Environment, Washington, D.C., 1992.

ON GRADUALISM, SHOCK TREATMENT AND SEQUENCING

José M. Fanelli and Roberto Frenkel[*]

Executive Summary

The paper presents a critical assessment of some relevant issues regarding the discussion on shock as opposed to gradualism in the implementation of economic adjustment. Since the discussion of these issues has emerged and developed in the literature on liberalization reforms under the heading of "the problem of sequencing", much of the paper is devoted to analysing such a problem.

The initial proposals of liberalization reforms were based on static arguments regarding the welfare advantages of free markets, and lacked an analysis of the dynamic path of the economy when it moves from a "repressed" setting to a complete elimination of non-market constraints. The lack of a systematic analysis was apparent when it was necessary to account for some failed liberalization attempts in the early 1980s, particularly with regard to the dramatic collapse of the so-called Southern Cone experiments.

The lessons on the sequencing of liberalization which appear in the market-friendly approach literature may be synthesized as follows:

(1) The transitional period is very long and difficult to manage. During this period the role of the State is crucial in designing the speed and attributes of each stage of liberalization, especially regarding trade, the decontrolling of the capital account and the financial system.

(2) The transitional period can be very painful and the Government has to take political constraints into account.

(3) During the transitional period, there will be a reduced availability of credit.

(4) The State has a crucial role to play with regard to the regulation of the economy. The analysis of financial crisis in the Southern Cone of Latin America, the Philippines and Turkey shows that the financial system must be tightly supervized by the authorities including, eventually, credit rationing and the control of interest rates.

This set of lessons was extracted from the analysis of processes of liberalization reform which were implemented in the past. The reforms that are now under way will give rise to several lessons as well. Many LDCs are now taking decisive steps in the direction of market liberalization. Beyond the "optimality" of the market-friendly approach strategy, the hypothesis that the adoption of such a strategy is a consequence of the weaknesses of the State cannot be discarded. The strategy promises to solve simultaneously two fundamental problems of the State: lack of financing; and lack of a clear definition of the State's role in development. The two fundamental problems are not solved but rather by-passed by the Washington Consensus approach. The lengthy transitional period of the liberalization strategy requires an efficient intervention by the State while the launching of the reform per se is unlikely to fulfil the financing needs of the economy.

Is it best to approach the study of the reforms which many countries are de facto implementing by considering them a problem of "sequencing"? This may not be the best strategy from either an economic policy or a theoretical point of view. Instead of beginning from a rather abstract notion of a fully-liberalized economic setting, and examining the supposedly correct sequence of steps needed to reach it without difficulties, it would be more fruitful to examine concrete steps of reform then to analyse the specific dynamics they generate. Room should be made to consider the potential role that government and market failures could play in determining the effects of specific measures.

In addition, the possibility that the dynamic path generated by the reform might be explosive should not be discounted. In the evaluation of the reform experiences, in terms of "correct" or "in-

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correct" sequencing, many authors make a strong a priori assumption: correctly ordered liberalizing reforms always set the economy on a stable path with a significant rate of growth. This assumption has no foundation other than beliefs derived from simplistic models and there are no reasons to exclude a priori the possibility of explosive paths or stagnant equilibria. This is true independently of the order in which reforms are implemented. Such assumptions do not help in understanding the characteristics of real reform processes. It is a fact that many liberalization attempts gave rise to explosive paths which must be accounted for. Obviously, the relevance of this issue is not only analytical.

Introduction

> *"Liberalizing a highly repressed economy has been likened to walking through a minefield: your next step might be your last."*
>
> McKinnon, 1991, page X.

The purpose of this paper is to present a critical assessment of some relevant issues regarding the discussion on shock as opposed to gradualism in the implementation of economic adjustment. Since the discussion of these issues has emerged and developed in the literature on liberalization reforms under the heading of "the problem of sequencing", it is worthwhile making an effort to analyse such a problem.

The initial proposals of liberalization reforms were based on static arguments regarding the welfare advantages of free markets, and lacked an analysis of the dynamic path of the economy when it moves from a "repressed" setting to complete elimination of non-market constraints. The lack of a systematic analysis of the dynamic properties of the model was clearly noted when it was necessary to account for some failed liberalization attempts in the early 1980s. This was particularly so with regard to the dramatic collapse of the so-called Southern Cone experiments. Since the failures were attributed to the order in which the liberalization measures were implemented, the search for a "correct" order of implementation gave rise to the emergence of the issue of sequencing as a more or less delimited area of research inside the liberalization framework. Interest in the issue increased during the 1980s as many LDCs and former socialist countries embarked on structural reform and it was necessary to evaluate the cost and benefits of a gradual versus a shock approach to liberalization.

In this way, the discussion of the dynamic properties of the liberalization framework was motivated by "real world" phenomena rather than by theoretical considerations and, consequently, from the very beginning, the analysis of the "problem of sequencing" was inextricably related to economic policy questions. Hence, account is taken not only of theoretical issues but also of concrete experiences of liberalization in the discussion which follows the dynamic questions posed by structural reform.

The paper is organized in four sections. The first section intends to place the sequencing problem in the literature on liberalization reforms and to identify different aspects of the problem. The second and third sections comprise a critical survey of the sequencing issue organized around the different aspects defined in the first section. Whereas the first three sections mainly focus on a critical assessment of the consistency of the liberalization framework, the fourth section presents an analysis of two experiences of liberalization reforms: Argentina and Chile in the late 1970s. Because these two cases played an important role in the gestation of the issue, reviewing the experiences and contrasting the present analysis with the sequencing approach offers a complementary, applied perspective to the previous sections. The last section includes some conclusions and a suggestion to redefine sequencing as a research issue outside of the liberalization framework.

I. Liberalization and sequencing

The authors who adopt the liberalization approach to development do not doubt that developing countries should rely more on the market mechanism.[1] Edwards (1986) put it in a nutshell when he said that an "impressive body" of empirical evidence indicates that liberalized and export-oriented economies outperform - in terms of both growth and equitable income distribution - repressed and closed economies. Along the same lines, Krueger (1986) wrote "the enormous success of Europe and Japan in expanding output and raising living standards was clearly related to the sustained liberalization of trade and capital flows" (page 15). The long-run steady-state benefits of liberalization stem from the fact that free trade and the absence of disturbances of the market mechanism lead to a maximum degree of allocation efficiency and to the specialization of the economy along the lines of comparative advantage (Michaely, 1986). Other beneficial consequences are that technical efficiency increases via competition while rent-seeking (Krueger, 1974) and directly unproductive profit-seeking activities (Bhagwati, 1982) are eliminated as long as the freeing of markets impedes the creation of artificial scarcities. Balassa (1986) emphasizes that it is necessary to take into account the effects not only on inter- industry specialization but also on intra-industry specialization; improvements in x-efficiency and unused capacity.

The basic diagnosis of the liberalization literature is, then, that instability and stagnation in less developed countries are rooted in the malfunctioning of markets. Although the neoclassical approach recognizes that markets may not work well because of the existence of market failures, on "empirical"[2] grounds this literature tends to assume that this is not generally the case. If market failures exist, the effects are supposed to be negligible. Therefore, liberalization is always welfare-improving.

The assumption is that it is excessive government intervention which explains the failures in the functioning of market structure. Government failure is much more relevant than market failure. According to Lal (1990) policy-induced distortions "have done more damage to Third World prospects than the so-called endogenous distortions in these economies that the policies were meant to cure" (page 268). It follows then that what is needed to overcome macroeconomic instability and to restore the growth process is to eliminate the non-market disturbances induced by Government. Once removed, resources will be optimally allocated according to market signals.

Krueger (1986) provides the following definition of liberalization: "A market is liberalized if there are no quantitative restrictions attempting to control either buyers or sellers, from which it would follow that liberalization is the act of removing quantitative controls" (page 17). However, as Krueger recognizes, given the complexities of the real world, more often than not this definition is too narrow. This is particularly so in the realm of economic policy making, where it would be better to work with a broader definition. Taking this into account, Krueger says that liberalization can be defined "as any policy action which reduces the restrictiveness of controls - either their complete removal or the replacement of a more restrictive set of controls with a less restrictive one. Under this definition, an action such as devaluation, given an import-licensing regime, liberalizes that regime" (page 16).

With these definitions in mind, one could expect the research agenda of the liberalization approach to give a prominent role to the analysis of the dynamic path of the economy when it is moving from a situation of repression of the market forces to the complete elimination of all non-market constraints. One could also expect a no less prominent role for the question of the correct sequencing of liberalization policies. However, this was not the case during the first stages of the theoretical development of this paradigm. Specifically, before the 1980s, much more effort was devoted to examining the "comparative static" properties of the model and to describing the benefits of the post-liberalization situation than to characterizing the properties of the disequilibrium path of the economy between repression and free market.

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[1] Fischer (1987) analyzes the main issues raised by the liberalization literature. See also the bibliography cited there. Fischer (1990) affirms that there are no longer two major competing economic development paradigms because the only paradigm is the market oriented one. This contention, however, has been recently challenged even by neoclasically-oriented writers. Krugman (1992) calls for a counter-counter-revolution in development economics: it "may serve as a caution against carrying a free-market orthodoxy too far" (page 21). Krugman ends the paper saying that "it is probably time once again to focus on market as well as government failures" (page 22).

[2] The quotation marks are due to the fact that there is some contradictory treatment of the issue of the empirical relevance of market failures in this literature. For example, they say that government intervention based on the existence of externalities should be avoided on the grounds that they are very difficult to identify and to quatify. If this is so, how can we be sure of the empirical irrelevance of such externalities?

The relevance given to the discussion of the dynamics of the model had greatly changed during the last decade or so. Specifically, the problem of the correct sequencing of the reforms received considerable attention. However, this new interest was motivated in a rather negative way: it was necessary to find an explanation for the failure of the liberalization attempts in the Southern Cone of Latin America and in countries in other regions as well (for example, the Philippines). One consequence was that the issues related to sequencing were introduced into the liberalization framework in a rather *ad hoc* way. They addressed this question not because of logical necessity for the theory but rather to explain *ex post facto* the economic facts that the theory in great measure had been unable to predict *ex ante*.

In principle, the optimal sequence for implementing a liberalization policy can be defined as that which maximizes the present value of the net addition to the economy (Michaely, 1986). Even though this definition of the optimal sequence seems to be clear, the implementation of such a concept gives rise to many complex theoretical and empirical questions. The first concerns the range of markets that should be taken into account in the analysis. Normally, the authors focus on a narrow set of markets: foreign exchange (including both current and capital transactions), financial, labour, and key domestic goods markets such as agriculture and energy (Krueger, 1983; World Bank, 1987; 1991). The second has to do with the order of the liberalization of each of the markets included in the above-mentioned set. Should all the markets be liberalized simultaneously? Is it better to liberalize in successive steps? If the latter is the optimal decision, what markets should be liberalized first? The third question that arises is that of the speed of the liberalization: How fast should each market be liberalized? Should the liberalization of a single market be made in one stage or is it better to attempt to implement it by means of a multi-stage policy? Closely related to the latter question is the problem of defining the attributes of the stages of the implementation of the reform in individual markets.

So far, the question of sequencing has been presented as one related to the dynamic problems attached to the comparative static theorems of the liberalization approach. However, during the 1980s, there was an enlargement of the set of issues addressed under the heading of "sequencing". The discussion of the questions posed by macroeconomic constraints and by the institutional setting of the reforms has steadily gained relevance.

The introduction of these new topics was mainly due to the fact that during the 1980s, the main policy recommendations of the liberalization literature were adopted as the official policy package by the World Bank and the IMF.[3] The most important potential candidates for the reform were the Latin-American and Sub-Saharan region suffering from the consequences of the debt crisis and the former socialist countries. Consequently, given the extreme macro-instability of these countries and the depth of the needed institutional reforms - which entailed not only the elimination of government intervention but also the restructuring of the State in itself - it was only natural that the liberalization approach should address both the problem of stabilization and that of the reorganization of the public sector. The adaptation of the liberalization approach to the new context of the 1980s gave rise to the so-called Washington Consensus (Williamson, 1990) or "market-friendly approach" to policy reform (World Bank, 1991).

In the most recent work of the Washington Consensus, the stabilization problem was completely integrated into the analysis of the reform (Williamson, 1990; World Bank, 1991). Therefore, it is now implicitly understood how necessary it is to define the order of the sequencing in which the *structural reforms* aimed at freeing domestic markets and the *stabilization policies* should be implemented. In analysing this issue, the liberalization literature has been amended to include the IMF adjustment approach.

The integration of the problems posed by the dynamic interaction between the reform of the public sector (especially privatization) and market liberalization, however, was much more difficult, particularly because there has been a tendency in this literature to by-pass the institutional and historical specificities of the countries under study.[4] In the 1991 *World Development Report*, for example, the economic problems of Bolivia and Poland have been analysed as if they were basically manifestations of the same phenomenon of "repression" of market forces.

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[3] *Strictu sensu*, the question of the order of stabilization vis-à-vis liberalization reforms began to be closely examined after the failure of the stabilization attempts of the early 1980s.

[4] Brutton (1989) stresses the importance of initial conditions, history and the general social environment. According

Indeed, as a consequence of the crisis of the former socialist countries, the production of literature on transition and reform in those countries is flourishing and there is a profuse flow of studies related directly or indirectly to the order in which economic reforms should be implemented.[5] In this literature, the discussion of the order in which markets should be *created* or the ways and velocity in which privatizations should take place overlaps with the issues traditionally treated by the literature on sequencing in developing market economies, which had mainly focused on trade and financial reform.

Although some of the lessons learned from the reforms attempted by less developed countries can undoubtedly be useful in the analysis of transition in former socialist countries, it is far from evident that analogies can be easily traced. This is so, among other reasons, because of the diversity of the institutional settings. It follows that, on an abstract level, the study of the optimal path of the economy and the sequencing of policies from repression to liberalization implies the analysis of the range, order, speed and attributes of each stage of the market-oriented reform, and of the macroeconomic and institutional settings in which such reforms will be implemented as well. These issues will be examined in greater detail below.

II. The problem of sequencing: reforms, short-run rigidities and political constraints

Should all the markets be liberalized at the same time? Which is more likely to succeed: shock treatment or gradual implementation of the reform? On strictly economic or analytical grounds, it seems that there is a consensus on the convenience of adopting a gradual treatment (i.e. sequential) rather than a sudden one. This consensus is not absolute, however. It seems to diverge especially on the analysis of the "political economy" aspects of the reform. Indeed, in this literature, there is a certain tension in the integration of economic policy recommendations based on economic analysis with those stemming from the consideration of political economy factors.

The ambiguities generated by this tension is patent in the treatment of gradualism versus the shock issue in the 1991 *World Development Report (WDR)*, which constitutes one of the most recent and influential policy-oriented works produced by the Washington Consensus. The standard recommendations on the correct order of reforms are clearly mentioned in the context of macroeconomic considerations, but at the same time the *WDR* seems to encourage a simultaneous approach. Indeed, the *WDR* introduces the concept of "shock therapy", exemplified by the mention of Bolivia, Ghana, Mexico and Poland. Most of the arguments in favour of this approach - defined as a quick and concentrated adjustment programme to be developed in a two-year period - rest on political economy considerations. A set of quick simultaneous reforms has the ability, we are told, to prevent the organization of resistant coalitions of interest groups. It should be underlined, on the other hand, that the set of reforms alluded to in the *WDR* is sometimes much broader than the standard trade-finance set, including, among others, labour market institutions, government administration and privatization.

Certainly, this tension between economic analysis and political-economy factors reflects the existence of a deeper tension between the state-of-the-art research on liberalization and sequencing, on the one hand, and the necessities of "practical men", on the other. Specifically, there is a wide knowledge gap between what can be said based on sound theoretical foundations and the amplitude and complexity of the questions posed by the ongoing liberalization efforts. But, while most researchers following the liberalization tradition believe that "more research is needed" especially with regard to the sequencing issue, policy-oriented writers argue in favour of the reform as if political conviction were much more important than the "details" regarding the dynamic behaviour of an economy after the implementation of liberalizing reform. The following section, will review these issues from both an analytical and a "political economy" point of view.

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to Brutton, "the policy-maker is never looking at a blank sheet on which he can put down what an objective, highly competent, but extremely narrow analysis tells him is the right policy. This is especially the case when it comes down to designing a specific policy in a specific country at a specific time" (page 1261).

[5] See Fischer (1992) and the bibliography there cited.

A. The rationale for gradualism and sequencing

Deepak Lal (1990) argues that in order to reap the benefits of liberalization, it is better to induce a complete and simultaneous lifting of all the non-market constraints. The only "if" allowed for in Lal's approach to structural reform is the need to eliminate macroeconomic imbalances first.

It can be said, nonetheless, that beyond particular disagreements -similar to that of Lal's- the vast majority of the economists subscribing to the Washington Consensus therapy are opposed to a simultaneous lifting of all the constraints. Such a majority would presumably agree with Krueger (1986) when she writes that "there is not sufficient experience with the "cold shower" approach to liberalization to provide confidence that its short-term costs can be contained within reasonable bounds ... the experience of Argentina, Chile and Uruguay have further provided support for the skeptics" (page 20).

In more general terms, it is argued that if markets performed their task in a world without imperfections, the best policy would be a simultaneous and complete liberalization of all markets. But the real world is much more complex than is assumed in theory (Edwards and Wijnbergen, 1989).

Even though the authors toiling in the liberalization tradition tend to discard the kind of failures that would call for discriminatory treatment and that could preclude liberalization from being the optimal tool for reaching the maximum degree of welfare (i.e. terms-of-trade effects, economies-of-scales or large externalities), most of them are aware that there are other imperfections in the real world. There are frictions in the functioning of markets and short- run rigidities, asymmetrical income distribution effects, macroeconomic-specific disequilibria and political factors that could have a bearing on the final results of alternative policies.

If, for example, the degree of protection removal from an activity is great, the production is likely to decline because capital goods and labour skills are to some extent specific. Therefore, unemployment may result from policy reform. The more the resources are called to move among widely different activities, the greater the significance of the frictional elements. It is then clear how necessary it is to graduate the liberalization effort (Michaely, 1986). Likewise, regardless of the pressures on unemployment rates, in a specific-factor setting, the larger and the more rapid the changes, the greater the consequences on income distribution will be. Because of unemployment and/or distributional consequences, political feasibility seems to call for an analysis of the cost-and-benefits of sequencing versus shock.

It is because of the existence of the above-mentioned imperfections that the "comparative static" statements of the liberalization approach yields no detailed guidance for the design of policy implementation (Michaely, 1986; Michalopoulos, 1987). Likewise, one could add, when "real world" complexities are taken into account, the statement avering that "from all the dynamic paths available one must be optimal" seems to lose much of its appeal, at least from an empirical point of view. To be of any practical relevance, the dynamic properties of economic policy recommendations need to be carefully evaluated in the light of the existing "real world" constraints.

Many of the economists identified with the "market-friendly approach" recognize that the study of these questions is just in its initial stages. In his analysis of the problem of sequencing, Michaely (1986) concluded that the problems of phasing and sequencing have not yet been addressed even though comprehensive studies of liberalization as a whole are available. Edwards (1986) closes his paper on these issues listing many unsolved questions. Indeed, once the "cold shower" alternative is discarded as not feasible, a whole set of new problems must be faced, problems that are both empirical and theoretical. That is, the question becomes how to analyse the effects of the reform on welfare, on macroeconomic balance, and on income distribution in a disequilibrium context (i.e. during the transition period) when using the analytical tools of the liberalization approach which had been developed to examine the properties of market equilibrium.

B. *The welfare effects of liberalization in a disequilibrium context*

If a single-step liberalization reform is operative, it follows that over a substantial time span, some markets will be working without restrictions while others will still be constrained by non-market factors. The existence of a transitional period of disequilibrium entails severe complications for standard welfare calculations.

The most important of these complications is that the main welfare economics theorems which show that the resource allocation yielded by the market mechanism constitutes a Pareto optimum are no longer valid when non-market constraints impede the simultaneous clearing of all the markets. The existence of distortions in the markets that remain unaffected by the reform implies that the elimination of distortions in another does not necessarily increase welfare. As the generalized theory of the second best states, if relevant links between markets exist and there is a reduction in the magnitude of a distortion in a single market, it is not possible to determine the direction in which welfare will change. In other words, we cannot be sure that the implementation of a specific stage of the liberalization policy will improve society's welfare. For example, starting from a situation characterized by distorted markets, there are no firm bases on which to ascertain that import liberalization will always be beneficial if, say, labour or capital markets are still repressed.

With regard to these issues, theory is blind. "All that can be said is that no general preference for the order of policies may be established on *a priori* grounds. Empirical observations may provide some lessons about the association of such sequencing with the likelihood of success of a policy package" (Michaely, 1986, page 54).

The question of the effects of liberalization is stated on empirical terms precisely because it cannot be proved on theoretical grounds that a hands-off policy is desirable when some markets are not working properly. In this context, the practical question is: when can a market be freed in reasonable confidence that the net effect will be welfare-improving?

Krueger (1986) formulates this question and answers that it is always welfare improving to liberalize the markets, with the exception of the capital account transactions of the balance of payments. But Krueger's arguments with regard to this are based on a rather casual empiricism. In fact, the issue of the welfare effects of deregulation in a disequilibrium context is treated neither rigorously nor systematically in the liberalization literature.

C. *Welfare and income distribution effects*

A second problem regarding the welfare effects of freeing the markets has to do with income distribution. Even if it were assumed that liberalization would result in an overall national welfare gain, there would be sectors that gain and sectors that lose. That is, there would be asymmetries in the distribution of the increases in welfare.

It is rather intriguing in this literature that while the idea that liberalization improves national welfare is supposed to be a matter of course, there is not much effort devoted to analyse how such gains could be managed or distributed. Indeed, with regard to income distribution, most of the analytical effort is directed at analysing how the existing pattern of distribution constitutes an obstacle for market deregulation.

It is argued, typically, that the government tends to behave on the basis of a conservative social welfare function which makes it reluctant to allow big changes in income distribution regardless of who gains and who loses. Likewise, government interventions are conceived of as tending to be dominated by the political process. An endless series of examples are given in order to show how interventionist policies in trade, the financial market, etc, are manipulated in practice by special-interest politics rather than being based on sound national cost-and-benefits calculations. According to many authors, these facts explain why it is so difficult to dismantle the ISI-type policies which were put into practice during the post-war period in many LDCs, particularly in Latin America.[6]

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[6] See, for example, Balassa *et al.*, 1986. The surveys by Krueger (1984) and Balassa (1989) are also particularly relevant to this issue.

Given that the complex structure of the protectionist and interventionist policies has created strong vested interests, it has sometimes been suggested that compensation measures should be used as a kind of bribe to get the losers to agree. In other word, compensation may induce them to accept the changes. But beyond this, regardless of the particular specification of the government's social welfare function, the only universally valid generalization provided by this literature for treating the allocation of welfare gains is methodological: efficiency and income distribution issues should be treated separately. A golden rule of economic policy-making according to the Washington Consensus is that policy-makers should use appropriate non-distortive tools to cope with income distribution matters. For efficiency gains to be attained, it is crucial to avoid inducing additional market distortions by resorting to second best alternatives when there are (usually?) first best policy measures available which are functional in achieving the same objective.

For example, when arguing that even in a disequilibrium context, deregulation of agricultural markets is likely to be welfare-improving, Krueger (1986) said: "I ignore the short-run welfare losses of low-income persons paying higher prices for food on the grounds that superior measures can be found to yield the same real income transfer" (page 24). However, it is very difficult to find in this literature a systematic treatment of such "superior measures" based on sound and informed "empirical observations". And when one does find analytical treatments of these matters, the conclusions are rather disappointing. Examining the issue within the neoclassical framework, Rottenberg (1986) observed that, when a policy change making the use of resources more efficient was implemented, it was practically impossible to compensate the losers without inducing additional disturbances which would run against the increase in efficiency. This is so whether the compensation was implemented via money payments or via complementary policy changes. Rottenberg's conclusion is not encouraging: he compares compensation payments to the opening of a Pandora's box of income and wealth transfers. Sometimes one feels that references to income-distribution-offsetting policies are no more than rhetorical arguments.

D. The ordering of the liberalization attempt

Concern with the order of implementation of market-oriented policies has gained momentum after the failure of many of the liberalization attempts in Latin America and elsewhere. Some ideas about the order of liberalization may be found in McKinnon's (1973) original work, but the concept of sequencing, related to a specific pattern of time phases of structural reforms, has emerged mainly as a reaction to the dramatic failures in the Southern Cone of Latin America. Edwards (1986), who devoted a significant effort to analysing the subject, has called attention to the fact that although the countries followed contrary orders - Argentina and Uruguay opened the capital account first, while Chile opened the current account first - all of them had a common fate: deep economic recession and (partial) reversal of the liberalization attempt. Edwards concludes, "at the present time there are no definite answers regarding these experiences and more research on the subject should be encouraged" (page 208). Likewise, Krueger (1986) considers that "further analysis of the liberalization efforts of the 1970s, especially in cases where domestic and international capital markets were important is called for" (page 30).

The liberalization efforts of the 1970s alluded to by Krueger collapsed in the early 1980s. Between 1980 and 1982 Argentina, Chile, and Uruguay underwent simultaneous external and domestic financial crises after a period of expansion financed by intensive international borrowing. The expansionist period followed liberalizing reforms in the trade regime and the deregulation of domestic and external financial flows. These reforms, combined with the active use of the exchange rate as an anti-inflationary device, apparently caused a boom in demand for real (mainly real estate) and financial assets, but a rise in consumption as well. There was also an increase in the number of financial intermediaries and the volume of deposits grew significantly. The negative side of this financial "deepening" was a growing fragility of the system, which ultimately ended up in generalized bankruptcy.

The Argentine experiment failed first: bankruptcies of financial institutions started in March 1980 and continued into the following years while a balance-of-payments crisis burst in March 1981. During the period in which the Argentine experience had collapsed while the Chilean had not, the earliest analyses of the Southern Cone experience in terms of sequencing appeared. The first cautions and recommendations on the order of liberalization were based on the comparison between Argentina and the (still at that time) thriving Chilean experience (McKinnon, 1982).

Taking Chile as a standard of "correct" sequencing of policy reform, the Argentine failure was attributed to a "premature" attempt at domestic financial liberalization coupled with the elimination of foreign exchange controls. The attempt was deemed to be premature because it was carried out before the completion of the trade reform and before a sustainable control over the government budget had been attained.

However, in 1982 the Chilean experience also collapsed. This occurred despite the fact that, unlike the Argentine case, the budget of the Government had been showing a substantial and continuous surplus and the trade account had been completely liberalized (McKinnon, 1982). The Chilean case could have been considered as a neat example of an endogenously generated financial cycle, experienced by a private and "liberalized" financial system. However, in the liberalization literature, the research strategy adopted was to examine the process in terms of an erroneous sequencing of reforms. In this way, the analysis developed for Argentina was also, *a posteriori*, taken as valid for Chile. Based on the empirical findings corresponding to the Chilean experience, the role of the destabilizing effects of external capital flows resulting from an untimely or abrupt lifting of controls of the capital account gained ground. Although in the case of Chile, the trade account had been completely liberalized, the standard recommendation became: liberalize external trade first and only then the capital account.

Beyond specific recommendations, an important consequence of the Southern Cone failures was that significant caveats were added to the liberalization optimism of the 1970s. Among the changes in the approach to liberalization in the research literature of the 1980s are three which are very important. First, there is now a much more cautious attitude toward capital flows, to the point that many well-known researchers working on the liberalization research agenda recommend the maintenance of a practically *sine die* control of external capital flows. Secondly, there is a much less naive emphasis on the virtues of domestic financial liberalization. McKinnon, one of the founding fathers of the theory of financial deregulation, in his latest work (McKinnon, 1991) even suggests the need for controlled interest rates during the transition process which is conceived of as taking years. Thirdly, there is a greater concern for the problems posed by stabilization vis-à-vis structural reform: it is now taken for granted that successful liberalization is not possible in a destabilizing macroeconomic environment.

In addition to the Southern Cone failures, another fundamental source of "empirical observations" on sequencing in the liberalization literature is the experience of the Asian NICs, particularly the Republic of Korea. It is normally interpreted that the highly successful far-eastern exporters had performed well because they had relatively free labour markets, a competitive domestic environment and liberalized trade regimes, while regulation of financial markets and interest rates persisted. The stable macroeconomic environment of these countries is likewise emphasized (Krueger, 1983; McKinnon, 1991).[7]

In brief, the most elaborated analyses of the order of implementation of the reform available today are based on a complicated mix of the liberalization-approach theoretical framework (amended to make room for the existence of frictions and short-run rigidities) and "empirical observations" (mainly regarding the experience of the Asian NICs and some Latin American countries) of the kind briefly mentioned above. On these bases, Krueger (1986) concludes that "A plausible argument can be made that optimal dismantling of controls might start with current account transactions, agricultural pricing, and the domestic labor and capital markets, leaving capital account transactions initially subject to controls. These controls would be removed (gradually? suddenly?) in a second stage of liberalization, once domestic resources had responded to altered policy signals" (page 30). These conclusions on the correct order of liberalization may be said to reflect closely what could be considered the market-friendly approach researchers' consensus on the issue.

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[7] In fact, the Republic of Korea had neither a "competitive domestic environment" neither nor "Liberalized trade regime" for the bulk of its growth period. See Amsdem (1989), Westphal (1990).

E. *Political constraints on the liberalization process*

The most important question addressed in the literature on the political-economy aspects of the transition period of the reform is: how can policies best be selected, phased and sequenced to gain the benefits of reform as quickly as possible while minimizing political resistance? (World Bank, 1987; 1991)

Given that, in the real world, compensation arrangements between winners and losers are deemed to be very difficult or even impossible, it is taken for granted that there will be sectors which will resist the implementation of the reform. Moreover, it is considered that such resistance is likely to take non-economic forms: those whose interests are threatened will use political means to obstruct reform. In this way, political factors enter the analysis of the market-friendly approach as relevant binding constraints on the dynamic path of economic liberalization.

As already noted, there are some problems in attempting to integrate into the analysis the political factors which have a bearing on the reform. In effect, on the one hand, it is recognized that the existence of short-run rigidities and macroeconomic imbalances calls for a sequential implementation of reform but, on the other hand, the need to act decisively is taken for granted: when the policy is hesitant and gradual, liberalization is much more likely to lose momentum as time elapses. In other words, it is considered that the faster and and more profound the policy changes, the greater the benefits, but also, the greater the likelihood that transitional costs will be higher.

Credibility is one of the reasons most often alluded for favouring dramatic changes, the object being to assure greater political sustainability for the liberalization process. It is necessary to enact decisive policy changes because credibility is an essential component of political sustainability. Credibility would be significantly strengthened by a dramatic shift in policy: if the policy change was sharp enough, economic agents would not expect the reform to be quickly or easily reversed.

Another important reason advanced is that a rapid and deep disarticulation of the old regime would not only severely weaken the resistance of "old" vested interests but would also generate "new" ones supporting the liberalized regime (World Bank, 1987). This could be a consistent strategy since the market friendly approach considers it extremely difficult to compensate losers. Equity considerations are obviously left aside.

However, the concern about the disarticulation of "old" vested interests occurring via rapid and decisive measures tends to weaken the Washington Consensus's analysis of the role of the "new" vested interests created by the reform. What would happen to efficiency if a monopoly were privatized and it were not possible to ensure an appropriate regulatory framework either because the State was weak or because the reform was implemented too quickly to be well planned? Even leaving equity aside, do the newly created vested interests better assure market competition than the old ones?

The liberalization literature has taught us much about the possible distortive consequences of protectionism and other interventionist policies, but there is nothing comparable in terms of research effort devoted to analysing what has happened in concrete situations of deregulation. For example, is the privatization process prone to domination by interest groups as was the case with ISI-like policies? Would not such a process open big opportunities for rent seeking and directly unproductive profit- seeking activities?

Indeed, the "market-friendly approach" treatment of the political factors is not always consistent. In order to deduce the theorems that support liberalization policies it is assumed that economic agents are fully rational. It is canonical in this literature to assert that if some opportunity were to be exploited, the private sector would take advantage of it. On the basis of this argument, infant-industry rationales for interventionist policies are discounted (Dixit, 1986). But when treating political factors, the rationality assumption is often weakened. For instance, it is adduced that "the informed public can readily infer those interests which are likely to be damaged in the short run by any liberalization effort; they cannot so readily see the economic activities that were harmed, and hence did not prosper, because of regulations" (Krueger, 1983, page 30). But if not even the "informed public" can envisage the benefits of the reform, who will - in a democratic context - turn public opinion in favour of the reform? This question seems relevant also because there is a generalized impression that the government is not capable of correctly evaluating such benefits, either. According to Edwards (1986), more liberalization attempts are not observed because, among other reasons, the time horizon relevant to a government may be different (shorter) from the time horizon relevant to an economy as a whole. In brief, while the liberalization literature clearly identifies the interest groups and the government goals that sustain interventionism, this is not at all the case with regard to the market-oriented reform.

Given that a good part of this literature is being produced by such institutions as the World Bank and the IMF, one sometimes feels that, in pushing for reform, an important role is implicitly assigned to external advisors. It should be taken into account, however, that in any of the "real world" institutional settings which characterize LDCs or former socialist countries, the State normally has a very reduced capacity not only for regulating the markets - as this literature correctly highlights - but also for properly programming and launching any policy package. If external support is used as the carrot, a government which is highly constrained by its financing needs is very likely to agree on a liberalization package. But if a quick and poorly designed reform is launched, many irreversible policy-induced distortions can result. Their costs could be high and the consequences, even in terms of generating new market distortions, could be long-lasting, as would be the case if an undue concentration of property or a monopoly situation resulted from the reform.

III. The stages of liberalization: individual markets and stabilization policies

According to Michaely (1986), the length and amplitude of the transitional disequilibrium period will be shorter when there are few rigidities in the labour market, less specific physical and human capital, flexible responses by entrepreneurs and a short life-span of physical capital in the contracting activities. Since these characteristics usually differ among sectors, an analysis of the speed with which each stage of the liberalization should be implemented in individual markets is necessary. Because of their importance to the determination of both macroeconomic stability and resource allocation, the study of the speed and attributes of each stage of the liberalization process has focused on an analysis of external trade and the domestic financial market. The role of external capital flows was mainly analysed in relation to trade liberalization and macroeconomic stability, while much less importance was given to the study of the problems posed by the deregulation of labour and other domestic markets. A review follows of the most important features of the sequencing of liberalization in each of these individual markets and the problems posed by stabilization vis-à-vis structural reform.

A. Trade liberalization

The problem of the speed and stages of liberalization of external trade has been very well analysed and empirically documented in the literature. Among the lessons concerning the transitional period which are usually stressed, two have special relevance to the present analysis of the dynamics of the market-oriented reform. First, after extensively reviewing the post-war trade liberalization experiences, the 1987 *World Development Report* states that "there is no single optimal path to reform" (World Bank, 1987). Although a sensible lesson, given the multiplicity of cases reviewed, it is in flagrant contradiction with the search for the optimal path alluded to elsewhere in the literature. Secondly, there is a wide consensus on the fact that trade liberalization is a long-lasting and difficult process. According to McKinnon (1991), a precipitate move towards free trade could provoke the collapse of manufacturing. In support of this assertion, he mentions the cases of the eastern part of Germany and of Poland, but he could also have mentioned many Latin American countries that implemented trade liberalizations in the 1970s and 1980s. In the same vein, the 1987 *World Development Report* affirmed that successful liberalizations were very lengthy. Countries such as the Republic of Korea or those in southern Europe had still not completed the trade reform even after *two decades*. This seems to be at variance with the shorter time span assigned to the reform in the 1991 *WDR* and with that which is implicit in the Washington Consensus recommendations.